SCIENCE

A WEEKLY JOURNAL DEVOTED TO THE ADVANCEMENT OF SCIENCE, PUBLISHING THE OFFICIAL NOTICES AND PROCEEDINGS OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

FRIDAY, JANUARY 24, 1902.

CONTENTS:

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

SECTION H, ANTHROPOLOGY.

THE winter meeting of Section H was held in the lecture hall of Field Columbian Museum, Chicago, on December 31, 1901, and January 1–2, 1902; Dr. J. Walter Fewkes, of the U. S. National Museum, presiding.

At the opening session, Dr. Geo. A. Dorsey was chosen press secretary. Professor Franz Boas was appointed to represent the Section on a committee to revise the schedule for measurements used in gymnasia. This committee, made up of members of various societies interested in physical education, is to report at the next meeting of the American Association for the Advancement of Physical Education.

A committee to confer with delegates from the Anthropological Society of Washington, D. C., and the American Ethnological Society, with special reference to increasing the usefulness of the *American Anthropologist,* as well as facilities for anthropological publication in general, was chosen as follows: Dorsey (chairman), Starr, Culin, Dixon, MacCurdy, Russell.

At the winter meeting in Baltimore one year ago a committee, consisting of F. W. Putnam (chairman), J. W. Powell and Geo. A. Dorsey, was appointed to 'take preliminary steps for the reception of the

International Congress of Americanists' on the occasion of its first meeting in the United States. The committee reported that it had performed the duty assigned, and respectfully requested to be discharged. The Section voted to discharge the Committee and to extend grateful appreciation for its labors. According to the circular accompanying Chairman Putnam's report, the thirteenth session of the International Congress of Americanists will be held in the halls of the American Museum of Natural History, in the City of New York, beginning at noon on Monday the 20th, and continuing until Saturday, the 25th of October, 1902.

The titles of papers presented before the Section are accompanied by brief abstracts in so far as these have been secured from the authors.

The Beginnings of Anthropology: W J McGee.

Discussion: Boas, Russell, Fewkes.

Twenty Years of Section H, Anthropology: George Grant MacCurdy.

An analysis of the work done by the Section since its organization, and a comparison of the same with that done by European societies of a similar nature. The conclusion reached is that, while American anthropologists have been working in relatively greater isolation than have European anthropologists, they are now at the threshold of a new epoch destined to be marked by vast progress in correlative and synthetic anthropology. This paper will be printed in Science.

Discussion: Newell, McGee, Starr, Peet, MacCurdy, Russell, Dorsey, Hartzell, Thompson, Boas.

The Exhibit of Hopi Ceremonies in the Field Columbian Museum: Geo. A. Dorsey.

Dr. Dorsey kindly consented to supplement his paper by an explanatory talk in the exhibition rooms on the closing day of the session. The following Hopi ceremonies as they occur at Oraibi have been reproduced on a magnificent scale for the Museum by Mr. Voth: Oöqol, Marau and Soyal Altars; Powalawu Sand Mosaic; Powamu Altar and Sand Mosaic; Katcina Initiation and Sand Mosaic; Masililantu Altar; Cho Altar and Sand Mosaic; Tcob Altar and Sand Mosaic; Balulukon Screen; Hemis Katcina Dancers; Aña Katcina Dancers. The Museum also possesses a large collection of Hopi dolls, masks and head dresses.

Discussion: Fewkes, McGee.

Some Painted Stone Slabs from the Graves of the Ruins of Walpi: Chas. L. Owen.

Mr. Owen's paper was descriptive, his hearers having also the satisfaction of seeing the objects described. The stone slabs were only recently installed.

Basketry Designs in Northern California: Roland B. Dixon.

The California Indians were confined almost exclusively to basketry for the expression of their artistic sense, and to this concentration of effort is due, in part at least, the perfection to which the art of basket-making was carried. There are several more or less clearly marked areas, each of which has its own type of basketry and basketry designs. In northern California alone there are three such type areas: (1) Northwestern (Hupa, Karok, Yurok, of Powers with perhaps the Shasta). (2) Northeastern (Klamath, Modoc, Pit River, Yana, Wintu and Maidu). (3) Pomo and perhaps neighboring stocks. In his paper the author refers only to the second and third areas. Often two or more stocks show the same designs but slightly differing one from another. As a whole, however, it appears that each stock is in possession of a body of designs peculiar to itself. The author also had something to say on

the questions of origin of designs and their transmission from tribe to tribe.

Discussion: Peet, McGee, Dixon, Boas, Dorsey and Hudson who gave reasons for favoring *Poma* as against *Pomo* for the name of one of the stocks in question.

Pueblo Indian Settlements near El Paso, Texas: J. WALTER FEWKES.

A study of the social organization, officers, dances, social and other customs, and linguistics of the Tiwan Indians of Ysleta; the Piros Indians of Senecu and Socorro; the Mansos and Sumas.

Discussion: Dorsey, Starr, Kinner, Fewkes.

Variability of Anthropometric Types: FRANZ BOAS.

The variability of organisms depends upon the correlation of their elements. The variability of the whole organism may, therefore, be considered largely an expression of correlation of its constituent parts. The greater the correlation of the parts constituting an organ, or included in a measurement, the greater will be its variability. Generally it is assumed that indices are expressions of correlation. The author demonstrated that they are not necessarily so, but that regression is the only sure test of correlation. The importance of the pathological method of studying correlation is emphasized. Professor Boas made free use of the blackboard as a means of illustration.

The Somatological Investigations of the Hyde Expedition: ALES HRDLICKA.

The Hyde Expedition comprises a variety of anthropological investigations on the peoples of the southwest, the whole being carried on under the direction of Professor Frederick W. Putnam for the American Museum of Natural History, New York City. The object of the somatological work of the Hyde Expedition, of which Dr. Hrdlicka is in charge, is to carry out a systematic investigation, mainly of a physical nature, on the extinct and living peoples of that part of the United States and Mexico which had once been occupied by the Pueblos with Cliff-Dwellers, and the Toltecs, Chichimecs and Aztecs. It is hoped that these studies will establish the physical types of these peoples and show their racial relations or diversities. The region over which this research extends is bounded approximately by the 38th parallel in the north, by the Rio Grande and the foothills of the Sierra Madre in the east, the Colorado River and Pacific Ocean in the west, and the States of Mexico and Michoacan in the south. It interlaces in the south with the region, the tribes of which were examined by Professor Starr and, in the north and northwest, connects with the field of work of the Jesup Expedition under Professor Boas. Dr. Hrdlicka began the outlined investigations in 1896, on the osteological material, principally Tarasco, collected by Dr. Lumholtz. In 1898 the field work was begun by the study of the tribes of Tarahumaras, Huichols and Tepecanos in Mexico. On the second expedition, in 1899, the research was carried on among the Utes and the Navahos, and on the third trip, in 1900, the investigation comprised the Mokis, Zuñis, Rio Grande Pueblos, all the divisions of the Apaches, Mohaves and a branch of the Piutes. At this moment Dr. Hrdlicka is starting on the fourth expedition, on which probably the field work will be completed. There will be visited the Suppais and Hualapais, Yumas, Pimas, Papagos, Yaquis, Tepehuanas, Coras, Aztecs, Tarascos and several smaller tribes. The work of the expedition will probably occupy the larger part of the coming year. The expenses of this as well as those of the 1900 and 1899 expeditions are generously provided for by Mr. Frederick E. Hyde, Jr., of New York city.

Some Observations concerning the Navaho Blanket Industry: Frank Russell.

The lantern slides not arriving in time, Dr. Russell did not read his paper. He, however, very kindly authorizes the secretary to make use of the abstract. Some tendencies in the progress of the Navaho blanket industry are described. The most noticeable changes are in the kind of yarn, the quality of the work and in the designs. Styles vary in different localities so that a little experience will enable one to name the district from which a given specimen comes. Methods of cheating the trader are described and an account given of the imitation Navaho blankets now offered for sale. The author tells how to identify imitations.

The Beginnings of Lithoculture: W J McGee.

Discussion: Fewkes, Thompson, Grimes, McGee, Hudson.

Certain Forms of 'Winged-perforated' Slate Objects: Warren K. Moorehead.

Mr. Moorehead's paper was fully illustrated by means of numerous originals and drawings. He called attention to the necessity of an archeological nomenclature for the various 'unknown forms' in slate and granite which have hitherto been called 'ceremonials'—a meaningless term in the opinion of the author. The paper is purely descriptive, dealing with form, type, distribution, etc.

Discussion: Culin, Moorehead.

A Voice Tonometer: Carl E. Seashore.

An exact and ready method of determining the pitch of tones in singing is described. The apparatus is a modified form of that described by Scripture, *Yale Studies in Psychology*, IV., 135. It works on the principle of the stroboscope and furnishes a direct reading of the vibration frequency of any tone sung within the range of two octaves. The reading is accurate to the twenty-fifth of a tone. Illustrations of results are given from measurements on the manner and the accuracy of striking a tone, singing the scale, singing the chromatic scale, singing an air, the singing of two notes in unison or in parts, and the singing of the least producible difference in pitch. The last named measurement is the most important because it furnishes a unit for the study of motor processes in singing and speaking.

The Psychological Elements of Visual Space Orientation about a Horizontal Axis: Robert MacDougall.

The paper is a summary statement of the results of experimental work carried on in the Harvard Psychological Laboratory during 1900–1901. Its problem is the determination of factors—and their values—of resident and transient sensation which enters into the location, by the human subject, of points in the horizontal plane of the eyes. The experimental variations involved comprise the characteristics of visual determination in an ordinary illuminated field, of the location of a luminous point in an otherwise dark field, and of orientation in complete darkness, in the case of both binocular and monocular vision. The points of greater importance here are the characteristic positive or negative errors of displacement in the subjective plane of the horizon, and the range of the normal mean variation; the influence of the cooperation and disjunction of the two eyes in the act of vision; and the general function of eye strain in such forms of space orientation. Special conditions of body strain are taken up, and an analysis made of the typical errors introduced into the process of space orientation by interferences with the normal body-relations. Of these artificially induced conditions the

chief are the rotation of the eyes about their horizontal axis, the rotation of the head about its lateral horizontal axis, and the rotation of the whole body about a similar axis. A consideration of the influence exerted by the general distribution of intensities in the visual field, and of object planes and lines of perspective upon the subjective location of points in the horizontal plane of the eyes. The paper concludes with an examination of the phenomena of coordination between eye and hand in determining the plane of the eye's horizon by the index finger, the significance of this series of determinations lying in the characteristic displacement of the located point due to changes in the fundamental axes of the head and eyes. Dr. MacDougall's paper will be printed in the Publications of Harvard Psychological Laboratory, Vol. I.

The Sherman Anthropological Collection of Holyoke, Massachusetts: GEORGE GRANT MACCURDY.

Mr. Gardner M. Sherman, of Springfield, Mass., an indefatigable collector for twenty-five years, has supplemented his own finds by exchanges and judicious purchases until the collection which bears his name now numbers from 12,000 to 16,000 specimens. The material is confined almost wholly to American archeology, representing geographically twenty-one States and Territories. Massachusetts, Georgia, Illinois and Tennessee are the largest contributors. The Connecticut River valley is particularly well represented. The collection was purchased last July by the Holyoke Scientific Society, and is to be installed in the new Public Library building. It is at present in the care of Mr. J. T. Draper, head of the science department of the Holyoke High School. This paper will be published in the *American Anthropologist.*

Filial Piety in China: PAUL CARUS.

A study of a pair of wall pendants, ornamental mottoes designed as decorations for the sitting-rooms of the Celestials. The paper and art work are crude enough to allow the assumption that the prints must be very cheap in China, and are designed not for the rich, but for the common people. They may cost in Peking or Hong Kong not more than one or two cents apiece. Evidently they serve two purposes: First, of ornament, and, secondly, of instruction. The Chinese are a moralizing people, even more so than we: while we dislike abstract moralizing, they delight in it and do not tire of impressing upon their children the praiseworthiness of filial devotion. Filial devotion is in Chinese *hsiao;* the character consists of two symbols showing a child supporting an old man, and filial piety is supposed to be the basis of all virtue. The moral relations are regarded as mere varieties of *hsiao;* and the original significance of the word, which means chiefly the devotional attitude of a child toward his parents, includes such relations as the obedience of the subject to his ruler, of the wife to her husband, of the younger brother to his elder brother, and of any one's relations to his superiors, including especially man's relation to God. The Chinese ornament their rooms, not as we do with pictures of beauty, but with moral sayings; and the two pendants described, which unfortunately cannot be reproduced here for lack of space, are typical of the national character of the Chinese.

The Significance of the Cross: PAUL CARUS.

Symbols pass through three stages, the magic, the emblematic and the ornamental. The Christian cross is unique in its conception. Prehistoric crosses are the same in form, but different in interpretation. The difference in meaning is important. For

the sake of distinguishing between the two, let us call the figure of intersecting lines a thwart, and reserve the word cross for its original significance, viz., a martyr instrument. The old cross, the Roman martyr instrument for capital punishment by exposure to the inclemency of the weather, Latin crux, Greek staurus, had sometimes the form of an irregular thwart, but not necessarily so. Whether or not Christ's cross was a thwart is doubtful; it is possible, however, since he is reported to have borne his cross, which obviously means the *patibulum*. Christianity adopted the thwart as the form of Christ's cross because the thwart was an old religious symbol of deep significance. Thwarts were used in all countries—Egypt, Assyria, India, among the Teutons, the Indians, etc. Their significance varies, and is frequently obliterated. By promiscuously calling all thwarts crosses, we are surprised at finding the Christian symbol universally adopted by pre-Christian religions. The fact is the reverse. Thwarts were used in different meanings by almost all the nations of the world, and then the thwart was identified with the cross to such an extent that, at present, cross has come to mean any figure of intersecting lines. How misleading this identification may be we can see in the Dakota story of the Susbeca, which is a thwart and like the Latin cross in shape, but which means dragon-fly. A missionary mistook the word in the Christian sense, so he gloried in his sermons with St. Paul in the susbeca of Christ. Translations of the New Testament and the Creed in the Dakota language, according to which Christ was crucified on a dragon-fly, are still extant. To the Dakotas the susbeca is a sacred religious symbol, and the missionary's mistake may have helped to recommend to them the Christian faith; but undoubtedly the confusion served to render more mysterious to them the mystery of the cross. The two papers by Dr. Carus were both fully illustrated, and will be published in *The Open Court*.

On Wednesday and Thursday mornings, the Section met with the American Folk-Lore Society, which, like Section H, is one of the Societies affiliated with the American Society of Naturalists.

George Grant MacCurdy,
Secretary.

THE AMERICAN CHEMICAL SOCIETY.

The annual winter meeting of the American Chemical Society, the twenty-fifth general meeting of the Society, was held in Philadelphia on the thirtieth and thirty-first of December, the assembly place being the University of Pennsylvania. The opening session was in Houston Hall at half past nine on Monday morning, when the usual felicitous words of welcome on behalf of the city, the university and the Philadelphia Section of the Society were spoken and duly responded to. The reports of the officers of the Society were read, those of the secretary and treasurer being particularly gratifying, showing large increase in membership and a considerable balance in the treasury. Including the members elected at the present meeting, the membership of the Society has passed the two thousand mark; with a very few exceptions, all the prominent chemists of the country are enrolled, and no inconsiderable number of foreigners as well. The value of the *Journal* of the Society is being more and more appreciated. Thirteen Sections of the Society are already established, and a fourteenth is now being formed on the Pacific slope.

Owing to the fact that most of the business is transacted through the Council, little came before the general meeting, but a resolution was passed memorializing the United States Government to pass a law making compulsory the use of the metric

system of weights and measures in all the departments except the Land Office. As is well known, its use is now optional, but outside of the scientific departments it is little used. In the Post Office and Treasury Departments its use is particularly desirable.

The remainder of the forenoon and the next morning were devoted to the reading of papers. The time for this was unfortunately so limited that hardly more than half of those on the program could find a place, and many of these were given only in abstract. The most interesting paper was of the nature of a lecture by Dr. Charles F. Chandler, of New York, on the 'Electrochemical Industries at Niagara Falls.' This was illustrated by a copious supply of specimens of the products of these industries, a very considerable portion of which was afterward presented to the museum of the chemical department of the University of Pennsylvania. Another paper which attracted much attention was by Professor Louis Kahlenberg, of the University of Wisconsin, on 'Instantaneous Chemical Reactions, and the Theory of Electrolytic Dissociation,' with experiments. The experiments illustrated facts brought to light by Dr. Kahlenberg which seem to controvert the ordinarily accepted theory of electrolytic dissociation, and no little interest was aroused by them. A list of the papers read is appended to this report.

At the close of each morning session a bountiful lunch was provided by the university authorities, after which the time till dark was occupied by excursions to various places of interest to chemists. There is no city in the country where there are so many industries in which chemistry plays an important part, and the time was well used by the visiting chemists. Indeed there was such a superfluity of trips that the members had to be grouped in six or seven sections each afternoon. The following list of places visited gives an idea of the wealth of opportunities for the study of industrial chemistry:

Baldwin Locomotive Works.
United States Mint.
City Filtration Experiment Station.
Bergner & Engel's Brewery.
Midvale Steel Company's Works.
Barrett Manufacturing Co., Working up of Coal-tar Oils.
United States Arsenal, Special Laboratory Equipment and Testing House.
John B. Stetson Company, Manufacturers of Hats.
Dungan & Hood, Glazed Kid and Morocco Works.
C. H. Masland & Sons, Carpet Mills.
Cramp's Shipyard.
Harrison Bros. & Company, Inc., Manufacturers of Chemicals and Paints, Electrolytic Method for the Production of Sodium.
Philadelphia Navy Yard.
United Gas Improvement Co., Works, Point Breeze.
Gillinder & Sons, Glass Works.
Quaker City Dye Works.
Wetherill & Bro., White Lead.
J. Eavenson & Son, Soap Works.
Girard College.

On Monday evening the address of the retiring president, Dr. F. W. Clarke, of Washington, was delivered at the rooms of the Acorn Club. His subject was 'The Development of Chemistry.' A rapid and graphic review of the past of chemistry gave indications of the lines along which chemistry may be expected to progress in the immediate future. The speaker dwelt particularly upon the desirability of cooperation in chemical research, rather than the present plan where every chemist works in his own field independent of the work of all others. Especially in inorganic chemistry are there many problems, too large for solution by single workers, which might be successfully attacked by the cooperative efforts of a number of chemists. Dr. Clarke also called attention to the mutual benefits accruing between technical

chemistry and pure chemistry, research work in each helping the other.

Immediately after the address, a reception was tendered by the Club to the members of the Society and their wives. A little later in the evening a smoker was held at the University Club where memories of German student life were renewed. On Tuesday evening the annual banquet was held at the Bingham House, the decorations and the *ménu* having a decided flavor of the laboratory. Dr. H. W. Wiley, of Washington, acted as Master of the Feast, and toasts were responded to by the mayor of the city, Theodore C. Search of the School of Industrial Art, and by several members of the Society. According to one of his colleagues, Professor Chandler had the honor of making the longest speech on record. He began in 1901 and did not close till the next year!

Dr. Ira Remsen, president of Johns Hopkins University, was elected president of the Society for the ensuing year.

A meeting of the Council of the Society was held on Tuesday afternoon, at which the resignation of Dr. Edward Hart as editor of the Society's *Journal* was regretfully accepted, and Dr. W. A. Noyes, of Rose Polytechnic Institute, was elected to succeed him.

Nearly two hundred were enrolled at the meeting, and probably not less than two hundred and fifty were present, making this the largest general meeting the Society has ever held. It was in every respect one of the most successful.

The following is a list of the papers read at the meeting:

Review of Metallography: Henry Fay.

A résumé of the recent work which has been done on alloys, especially of those using the methods of physical chemistry and the microscope.

Naturally Occurring Tellurid of Gold: Victor Lehner.

The only occurrence of gold in nature combined with another element is the tellurid. A crystallographical and chemical study of these tellurids throws much doubt upon their being anything other than a mixture of the elements.

Action of Selenic Acid on Gold: Victor Lehner.

Doubt has been cast upon the oft repeated text-book statement that gold dissolves in selenic acid. It was found that gold does dissolve with considerable readiness in concentrated selenic acid at 230°–300°, forming an auric selenate. This is the only single acid, as far as known, in which gold is soluble.

The Quantitative Blowpipe Assay of Tellurid Gold Ores: Joseph W. Richards.

Contrary to the general opinion, this assay presents no difficulty. In the muffle assay, however, if much tellurium is present, the gold 'spits' and often sinks completely into the cupel. This may be obviated by adding antimony.

A New Blowpipe Reaction for Germanium: Joseph W. Richards.

Argyrodite gives a white sublimate like molybdenum, which becomes an intense blue when heated with cobalt nitrate.

Contributions to the Chemistry of the Rare Earths of the Yttrium Group: L. M. Dennis and Benton Dales.

A review of the various methods of separation of the rare earths, and the announcement of several new ones, which promise well.

Preliminary Note on a New Separation of Thorium: F. J. Metzger.

Thorium may be separated from the other rare earths almost quantitatively by

fumaric acid. This reaction seems to be connected in some way with the molecular asymmetry of the acid molecule.

Sodium: J. D. DARLING.

Description of the electrolytic method in use at the works of Harrison Bros. & Co., for the production of sodium. This method was introduced primarily for the manufacture of nitric acid. A diaphragm four inches thick, made of magnesite and Portland cement, separates the two electrolytes. On the outside of this, fused sodium nitrate is at the anode, while the inner electrolyte surrounding the kathode is sodium hydroxid. As the current passes, this soon becomes sodium oxid, and then metallic sodium is formed. A current of about six hundred amperes at seven volts is used. The supply of metallic sodium on hand in storage is now so great that the city authorities have had the operation of the process stopped, fearing accident.

The Determination of Silica: W. F. HILLEBRAND.

The results of the analyses of a set of cement samples by a large number of chemists revealed great discrepancies in the amount of silica. This is chiefly due to the fact that one evaporation is not sufficient to render the silica insoluble. Further, the silica must be heated by a blast lamp before weighing.

Electro-Chemical Industries at Niagara Falls: C. F. CHANDLER.

A review of the history and a description of the processes used, illustrated by a large number of specimens. The manufacture of sodium, aluminum and carborundum was most fully considered.

Instantaneous Chemical Reactions, and the Theory of Electrolytic Dissociation (with experiments): LOUIS KAHLENBERG.

The oleates of the metals are soluble in perfectly dry benzene, and from these solutions the anhydrous chlorids are instantly precipitated by a dry benzene solution of hydrochloric acid. These solutions in benzene are practically non-conductors of electricity, consequently electrolytic dissociation cannot be supposed to have taken place; yet the reactions appear to be exactly parallel to those in aqueous solutions, to account for which the electrolytic dissociation theory is invoked.

What are the Requirements of a Course to Train Men for Work in Industrial Chemistry? W. A. NOYES.

It cannot be generally told what line of industrial chemistry a student will follow after graduation, and there are so many different fields that it would be impossible to train a man in the special technical requirements of every industry, and there should be no attempt to do this. Students should be thoroughly grounded in the general fundamental principles and have extended practice along several different lines of practical work. The special minutiæ of any branch the student may enter will then be readily learned after graduation.

The Volumetric Estimation of Alumina, and Free and Combined Sulfuric Acid in Alums: ALFRED H. WHITE.

A method depending upon the proper choice of indicators.

Aqua Ammonia: Its Impurities and Methods of Analysis: J. D. PENNICK and D. A. MORTON.

A Method of Analyzing Oil Varnishes: PARKER C. MCILHINEY.

The Oxygen Bases: A Review: JAS. LEWIS HOWE.

An outline of the recent work of Collie, Baeyer, Kehrmann, Werner and others, on compounds in which oxygen appears to be quadrivalent, forming salts with acids, as do ammonia and its derivatives.

Electrolytic Deposition of Lead from P_2O_5 Solution: A. F. Linn.

Lead can be deposited electrolytically in a form suitable for weighing from a solution containing free phosphoric acid.

Latest Types of Formaldehyde Regenerators (with demonstration): Wm. Dreyfus.

An exhibition of the various types of apparatus with a discussion of their relative merits.

Some Pyridin Derivatives: J. Arthur Hayes.

Report of Committee on Atomic Weights: F. W. Clarke, Chairman.

Attention was called to the atomic weight determinations which have been made during 1901.

Sixteen other papers on the program were omitted from lack of time for presentation; most of these will be later published.

J. L. H.

THE ASSOCIATION OF AMERICAN ANATOMISTS.

The fifteenth session of the Association, meeting with the American Society of Naturalists and affiliated societies, was held at Chicago, Ill., December 31, 1901, to January 2, 1902. The Association met in the Hull Laboratory of Anatomy, Chicago University.

The following extracts are made from the report of the secretary for 1900–01:

There are copies of the printed proceedings on hand from the 6th to the 14th volumes, inclusive, which are available to those who request them, and are especially so for presentation to libraries. A republication of the first five proceedings under one cover is being made.

At the last report there were 125 members, 116 of whom were active and nine honorary. During the year twelve active members were elected, two died, one resigned, and three have been dropped for non-payment of dues. The present number is 131 total members, 122 active, 9 honorary.

Dr. Frederick John Brockway, assistant demonstrator of anatomy, Columbia University, New York, died April 21, and Dr. Geo. Wm. West, late professor of anatomy and physiology, medical department, National University, Washington, D. C., died July 24.

The following new members were elected:

Dr. R. R. Bensley, Asst. Prof. Anat., University of Chicago.

Dr. John L. Bremer, Harvard University.

Benson A. Cohoe, A.B., M.D., Asst. in Anat., Cornell University.

Henry H. Donaldson, Prof. Neurology, University of Chicago.

Dr. W. T. Eckley, Prof. Anatomy, College Physicians and Surgeons, Chicago, and Dr. Corinne B. Eckley, Demonstrator of Anatomy, same college.

Albert C. Eycleshymer, Instructor in Anat., University of Chicago.

Irving Hardesty, Ph.D., Instructor in Anat., University of California.

J. Ralph Harris, M.D., Asst. in Anat., Cornell University.

Basil C. Harvey, Asst. in Anat., University of Chicago.

Dr. Arthur E. Hertzler, Halstead, Kansas.

Dr. C. M. Jackson, Prof. Anat., University of Missouri.

Dean D. Lewis, Asst. in Anat., Univ. Chicago.

Dr. Warren H. Lewis, Instructor in Anat., Johns Hopkins.

Andrew H. Montgomery, A.B., M.B., Associate in Anat., Cornell.

Charles Aubery Parker, Instructor in Anat., Rush Med. College.

Daniel G. Revell, Associate in Anat., University of Chicago.

Dr. Fredrick C. Waite, Prof. Histology, Western Reserve University.

Dr. J. Clarence Webster, Prof. Obstetrics, Rush Med. College.

Dr. F. A. Woods, Harvard University.

The following were reelected:

Dr. T. S. Lee, University of Minnesota.

Dr. S. W. Williston, Prof. Vertebrate Anatomy and Paleontology, Kansas University, Lawrence, Kansas.

The total new members was 22, making a total membership of 153, of whom 9 are honorary.

The following recommendations of the executive committee were adopted by the Association:

1. That Section V. of the constitution be amended to read that the management of the affairs of the Association shall be delegated to an executive committee consisting of seven members, including the president and secretary, *ex officio*.

2. That three new members of the executive committee be elected at this meeting, one for three years, one for four years, and one for five years.

3. That the Association accept the offer of the editorial committee of the *American Journal of Anatomy* to furnish each member of the Association with the *Journal* at $4.50 per year; the *Journal* to publish the proceedings of the meetings of the Association, including an abstract of the papers read.

4. That the committee on circular on anatomical peculiarities of the negro be discharged.

5. That after this meeting the maximum limit of time of reading a paper shall be twenty minutes, and two papers shall not be read consecutively by the same writer.

The following officers were elected: President, Dr. Huntington, New York; First Vice-President, Dr. Lamb, Washington; Second Vice-President, Dr. Piersol, Philadelphia; Secretary and Treasurer, Dr. Huber, Ann Arbor; Executive Committee, Dr. Hamann (three years), Cleveland, Ohio; Dr. Barker (four years), Chicago; Dr. Gerrish (five years), Portland, Me.

The following was adopted, on motion of Dr. Gerrish: "The thanks of the Association are hereby given to the retiring secretary and treasurer, Dr. Lamb (who has positively declined a reelection), for his long, faithful and eminently satisfactory service." Dr. Lamb has been secretary-treasurer since 1890.

The following papers were read:

1. 'Models illustrating the Development of the Arm in Man': DR. W. H. LEWIS, Baltimore. Discussed by Drs. McMurrich, Huntington, Terry, Chas. Hill and Harrison.

2. 'A One Year Anatomical Course; its Arrangement, Merits and Disadvantages': DR. TERRY, St. Louis. Discussed by Drs. Barker and Huntington.

3. 'Factors and Stages in the Evolution of the Stomach': DR. BENSLEY, Chicago. Discussed by Dr. Huntington.

4. 'Sections of the Decalcified Body,' illustrated by specimens: DR. TERRY. Discussed by Drs. Jackson, Huber and Huntington.

5. 'A Case of Breech Presentation in a Monkey,' with specimen: DR. TERRY.

6. 'Note on the Structure of the Motor Endings in Striated Muscles': DR. HUBER, Univ. Mich. Discussed by Drs. Huntington and Bensley.

7. 'Neuro-muscular Spindles in the Intercostal Muscles': DR. HUBER. Discussed by Drs. Ingbert and Terry.

8. 'A Note on the Supracondylar Process,' illustrated by specimens: DR. TERRY. Discussed by Drs. Bensley and Huntington.

9. 'The Development of the Pulmonary Artery': DR. J. L. BREMER, Boston. Discussed by Drs. Huber and Huntington.

10. 'Skeleton with Rudimentary Clavicles, Divided Parietal Bones and other Anomalous Conditions': DR. TERRY. Discussed by Drs. Huntington, W. H. Lewis and Barker.

11. 'Skull Showing Many Wormian Bones': DR. PARKER, Chicago. Discussed by Drs. Huntington and Terry.

12. 'The Neuroglia of the Optic Nerve and Retina of Certain Vertebrates': DR. HUBER. Discussed by Drs. Minot and Barker.

13. 'Present Problems of Myological Research and the Significance and Classification of Muscular Variations': DR. HUNTINGTON, New York City. Discussed by Drs. McMurrich and Huber.

14. 'The Phylogeny of the Long Flexor Muscles': DR. MCMURRICH, Ann Arbor. Discussed by Dr. Huntington.

15 'Note on the Occurrence and Significance of the Musculus Tibio-astragalus': Dr. McMurrich. Discussed by Dr. Huntington.

16. 'Nuclear Changes in the Muscle Cell': Dr. Eycleshymer, Chicago. Discussed by Dr. Barker.

17. 'The Plesiosaurian Skull': Dr. Williston, Lawrence, Kansas. Discussed by Dr. Huntington.

18. 'The Shape of the Pyloric Glands of the Cat': Dr. DeWitt. Presented by Dr. Huber, Ann Arbor.

19. 'An Illustration of the Value of the Functional System of Neurones as a Morphological Unit in the Nervous System': Dr. Herrick, Denison University, Ohio.

20. Dr. Terry showed his specimen of *Situs inversus*.

21. 'The Sphincter superior': Dr. R. C. Bourland, University of Michigan. Read by Dr. McMurrich. Discussed by Dr. Huntington.

22. 'Development and Variation in Distribution of the Thoracico-abdominal Nerves': Dr Bardeen, Baltimore. Discussed by Dr. Huntington.

23. 'The Ducts of the Pancreas': Dr. D. G. Revell, Chicago. Discussed by Dr. Huntington.

24. 'Variations in the Distribution of the Bile Ducts of the Liver of the Cat': Dr. Horace Johnson, Madison, Wis. Discussed by Dr. Huntington.

25. 'Contribution to the Morphology of the Cerebellum': Dr. Stroud, Cornell University. Read by the Secretary.

26. 'Histogenesis of the Sensory Nerves of Amphibia': Dr. Harrison, Baltimore. Discussed by Drs. Huber and Herrick.

27. 'The Growth of the Mammalian Spinal Ganglion': Dr. Donaldson, Chicago. Discussed by Drs. Huber and Huntington.

28. 'The Frontal Fissures in the Brains of Two Natives of British New Guinea': Dr. Huntington.

The following papers were read by title:

1. 'On the Development of Connective Tissue Fibrils': Dr. Mall, Baltimore.

2. 'Unusual Forms of Placentation': Dr. Webster.

3. 'Contribution to the Anatomy of the Scapula': Dr. Hrdlicka, New York City.

4. 'Certain Racial Characteristics of the Base of the Skull': Dr. Hrdlicka.

5. 'On Certain Anomalies of Bones': Dr. Dorsey, Chicago.

6. 'Some Anomalies of Blood-vessels': Dr. Blair, St. Louis.

7. 'Two Specimens of Anomalous Viscera with Left-sided Appendix': Dr. Holmes, Philadelphia.

8. 'Models of Human Pharynx of First Six Weeks' Development': Dr. Sudler, Baltimore.

9. 'The Ducts of the Submaxillary Glands': Dr. Flint, San Francisco.

10. 'Contribution to the Encephalic Anatomy of the Races': E. A. Spitzka, New York City.

11. 'Description of the Brain of a Regenticide': Mr. Spitzka.

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*A PLEA FOR GREATER SIMPLICITY IN THE LANGUAGE OF SCIENCE.**

Scientific ideas are with difficulty soluble in human speech. Man, in his contemplation of the flux of phenomena at work all about him, is embarrassed by the want of a vehicle of thought adequate for expression, as a child whose stammering accents do not permit him to tell his mother the new ideas which suddenly crowd upon him when he meets with something alien to his experience.

Our knowledge of the mechanism of nature has been undergoing a process of growth, much of which has been sudden. It is not surprising, therefore, that the incompletely formed ideas of science should become translated into clumsy language and that inexact thinking should be evidenced by vagueness of expression. This inexactness is often veiled by the liberal use of sonorous Greek-Latin words.

The growth of knowledge has required an increase in the medium of intellectual exchange. New conceptions have called for new terms. Sir Courtenay Boyle has pointed out that the purity of a nation's coinage is properly safeguarded, while the verbal coinage of its national language is subject to no control. Specially qualified persons prepare the standards of gold and silver. This insures the absolute purity of the measures of commercial exchange and gives the English sovereign and the American gold piece, for example, an assured circulation along all the ave-

*A paper read before Section E of the American Association for the Advancement of Science, August 28, 1901.

nues of commerce. It is not so with the standards of speech. The nation debases its language with slang, with hybrid and foreign words, the impure alloys and the cheap imports of its verbal coinage, mere tokens which should not be legal tender on the intellectual exchanges. France has an academy which in these matters has much of the authority given to the Mint, whose assayers test our metal coins; but in our country the mintage of words is wholly unrestricted, and, as a consequence, the English language, circulating as it does to all the four corners of the globe, has received an admixture of fragments of speech taken from various languages, just as the currency with which one is paid at the frontier, where empires meet, includes the coinage of several governments, each of which passes with an equally liberal carelessness.

Science ignores geographical lines and bemoans the babel of tongues which hinders the free interchange of ideas between all the peoples of the earth. Nevertheless, the international character of technical literature is suggested by the fact that three languages, French, German and English, are practically recognized as the standard mediumsof intellectual exchange. One of these affords the most lucid solvent of thought, another is the speech of the most philosophical of European people and the third goes with world-wide dominion, so that each has a claim to become the recognized language of science. The brotherhood of thinking men will have been fully recognized when all agree to employ the same tongue in their intercourse, but such a 'far-off divine event' is not within the probabilities of the present, consequently there remains only for us to make the best of our own particular language and to safeguard its purity, so that when it goes abroad the people of other countries may at least be assured that they are not dealing with the debased currency of speech.

Barrie has remarked that in this age the man of science appears to be the only one who has anything to say—and the only one who does not know how to say it. It is far otherwise in politics, an occupation which numbers among its followers a great many persons who have the ability for speaking far beyond anything worth the saying that they have to say. Nor is it so in the arts, the high priests of which, according to Huxley, have 'the power of expression so cultivated that their sensual caterwauling may be almost mistaken for the music of the spheres.' In science there is a language as of coded telegrams, by the use of which a limited amount of information is conveyed through the medium of six-syllabled words. Even when not thus overburdened with technical terms it is too often the case that scientific conceptions are conveyed in a raw and unpalatable form, mere indigestible chunks of knowledge, as it were, which are apt to provoke mental dyspepsia. Why, I ask, should the standard English prose of the day be a chastened art and the writing of science, in a great scientific era, merely an unkempt dressing of splendid ideas? The luminous expositions of Huxley, the occasional irradiating imagery of Tyndall, the manly speech of Le Conte, and of a very few others, all serve simply to emphasize the fact that the literature of scientific research as a whole is characterized by a flat and ungainly style, which renders it distasteful to all but those who have a great hunger for learning.

To criticism of this sort the professional scientist can reply that he addresses himself not to the public at large, but to those who are themselves engaged in similar research, and he may be prompted to add to this the further statement that he cannot pitch the tone of his teaching so as

to reach the unsensitive intelligence of persons who lack a technical education. Furthermore, he will claim that he cannot do without the use of the terms to which objection is made. However, in condemning the needless employment of bombastic words of classical origin, in place of plain English, I do not wish to be understood as attacking all technical terms. They are a necessary evil. Some of them are instruments of precision invented to cover particular scientific ideas. Old words have associations which sometimes unfit them to express new conceptions and therefore fresh words are coined. The complaint lodged against the pompous, ungainly wordiness of a large part of the scientific writing of the day is that it is an obstacle to the spread of knowledge.

Let us consider the subject as it is thus presented. In the first place, does the excessive use of technical terms impede the advancement of science? I think it does. It kills the grace and purity of the literature by means of which the discoveries of science are made known. Ruskin, himself a most accurate observer of nature, and also a geologist, said that he was stopped from pursuing his studies 'by the quite frightful inaccuracy of the scientific people's terms, which is the consequence of their always trying to write mixed Latin and English, so losing the grace of the one and the sense of the other.' But grace of diction is not needed, it may well be said; that is true, and it is also true that a clear, forceful, unadorned mode of expression is more difficult of attainment and more desirable in the teaching of science than either grace or fluency of diction. One must not, as Huxley himself remarks, 'varnish the fair face of Truth with that pestilent cosmetic, rhetoric,' and Huxley most assuredly solved the problem of how to avoid rhetorical cosmetics and yet convey deep reasoning on the most complex of subjects in addresses which are not only as clear as a trout stream, but are also brightened by warm touches of humanity, keen wit and the glow of his own courageous manhood. Nevertheless, though clearness of expression be the first desired, yet grace is not to be scorned. When you have a teaching to convey, it is well to employ all the aids which will enable you to get a sympathetic hearing. Man lives not by bread alone, much less by stones. He likes his mental food garnished with a sauce. Let the cooking be good, of course, but a *chef* knows the value of a well-seasoned adjunct to the best dish.

Our language is capable of a grace and a finish greater than we give it credit. That it is possible to write on geology, for instance, in the most exquisite simple English has been proved by Ruskin, whose 'Deucalion' and 'Modern Painters' contain many pages describing accurately the details of the structure of rocks and mountains, and dealing with their geological features in language which is marked by the most sparing use of words which have not an Anglo-Saxon origin.

The next aspect of the enquiry is whether the language of science, apart from the view of mere grace of style in literature, is not likely, in its present everyday form, to delay the advance of knowledge by its very obscurity. Leaving the reader's feelings out of the argument, for the present, it seems obvious that the whole purpose of science, namely, the search after truth, which is best advanced by accuracy of observation and exactness of statement, is hindered by a phraseology which sometimes means very much but oftener means very little, and, on the whole, is most serviceable when required as a cloak for ignorance. To distinguish between what we know and what we think we know, to comprehend accurately the little that we do know, surely these are

the foundations of scientific progress. If a man knows what a thing really is, he can say so, describing it, for example, as being black or white; if he does not know, he masks his ignorance by stating in a few Greek or Latin terms that it partakes of the general quality of grayness. Writers get into the habit of using words that they do not clearly understand themselves and which, as a consequence, must fail in conveying an exact meaning to their readers. Many persons who possess only the smattering of a subject are apt to splash all over it with words of learned sound which are more quickly acquired, of course, than the reality of knowledge. Huxley said that if a man does really know his subject "he will be able to speak of it in an easy language and with the completeness of conviction, with which he talks of an ordinary everyday matter. If he does not, he will be afraid to wander beyond the limits of the technical phraseology which he has got up." If any scientific writer should complain that simplicity of speech is impracticable in dealing with essentially technical subjects, I refer him to the course of lectures delivered by Huxley to workingmen, lectures which conveyed original investigations of the greatest importance in language which was as easily understood by his audience as it was accurate when regarded from a purely professional standpoint.

Science has been well defined as 'organized common sense'; let us then express its findings in something better than a mere jargon of speech and avoid that stupidity which Samuel Johnson, himself an archsinner in this respect, has fitly described as 'the immense pomposity of sesquipedalian verbiage.' George Meredith, a great mint-master of words, has recorded his objection to 'conversing in tokens not standard coin.' Indeed the clumsy latinity of much of our scientific talk is an inheritance from the schoolmen of the past; it is the degraded currency of a period when the vagaries of astrology and alchemy found favor among intelligent men.

Vagueness of language produces looseness of knowledge in the teacher as well as the pupil. Huxley, in referring to the use of such comprehensive terms as 'development' and 'evolution,' remarked that words like these were mere 'noise and smoke,' the important thing being to have a clear conception of the idea signified by the name. Examples of this form of error are easy to find. The word 'dynamic' has a distinct meaning in physics, but it is ordinarily employed in the loosest possible manner in geological literature. Thus, the origin of a perplexing ore deposit was recently imputed to the effects produced by the 'dynamic power' which had shattered a certain mountain. 'Dynamic' is of Greek derivation and means powerful, therefore a 'powerful power' had done this thing; but in physics the word is used in the sense of active, as opposed to 'static' or stationary, and it implies motion resulting from the application of force. In the case quoted, and in many similar instances, the word 'agency' or 'activity' would serve to interpret the hazy idea of the writer, and there is every reason to infer, from the context, that he substituted the term 'dynamic power' merely as a frippery of speech. It is much easier to talk grandiloquently about a 'dynamic power' which perpetrates unutterable things and reconstructs creation in the twinkling of an eye than it is to make a careful study of a region, trace its structural lines and decipher the relations of a complicated series of faults. When this has been done and a writer uses comprehensive words to summarize activities which he has expressly defined and described, then indeed he has given a meaning to such words which warrants him in the use of them.

In this connection it is amusing to remember how Ruskin attacked Tyndall for a similar indiscretion. The latter had referred to a certain theory which was in debate, and had said that it, and the like of it, was 'a dynamic power which operates against intellectual stagnation.' Ruskin commented thus: "How a dynamic power differs from an undynamic one, and, presumably, also, a potestatic dynamis from an unpotestatic one—and how much more scientific it is to say, instead of—that our spoon stirs our porridge—that it 'operates against the stagnation of our porridge,' Professor Tyndall trusts the reader to recognize with admiration."

Among geological names there is that comfortable word 'metasomatosis' and its offspring of 'metasomatic interchange' 'metasomatic action,' 'metasomatic origin,' etc., etc. To a few who employ the term to express a particular manner in which rocks undergo change, it is a convenient word for a definite idea, but for the greater number of writers on geological subjects it is a wordy cloud, a nebular phrase, which politely covers the haziness of their knowledge concerning a certain phenomenon. When you don't know what a thing is, call it a 'phenomenon'! Instances of mere vulgarity of scientific language are too numerous to mention. 'Auriferous' and 'argentiferous' are ugly words. They are unnecessary ones also. The other day a metallurgical specialist spoke of 'auriferous amalgamation' as though any process in which mercury is used could be gold-bearing unless it was part of the program that somebody should add particles of gold to the ore under treatment. A mining engineer, of the kind known to the press as an expert, described a famous lode as traversing 'on the one hand a feldspathic tufaceous rock' and 'on the other hand a metamorphic matrix of a somewhat argillo-arenaceous composition.' This is scientific nonsense, the mere travesty of speech. To those who care to dissect the terms used it is easily seen that the writer of them could make nothing out of the rocks he had examined, save the fact that they were decomposed and that the rock which he described last might have been almost anything, for all he said of it; for his description, when translated, means literally a changed matter of a somewhat clayey-sandy composition, which, in Anglo-Saxon, is m-u-d! The 'somewhat' is the one useful word in the sentence. Such language may be described in the terms of mineralogy as metamorphosed English pseudomorphic after blatherskite. Some years ago, when I was at a small mine near Georgetown, in Colorado, a professor visited the underground workings and was taken through them. He immediately began to make a display of verbal fireworks which bewildered the foreman and the other miners whom he met in the mine, all save one, a little Cornishman, who, bringing him a bit of the clay which accompanied one of the walls of the lode, said to him, 'What do 'ee call un, you?' The professor replied, 'It is the argillaceous remnant of an antediluvian world.' Quick as a flash came the comment, 'That's just what I told me pardner.' He was not deceived by the vapor of words.

Next consider the position of the reader. It is scarcely necessary at this date to plead for the cause of technical education and the generous bestowal of the very best that there is of scientific knowledge. The great philosophers of that New Reformation which marked the era of the publication of 'The Origin of Species' have given most freely to all men of their wealth of learning and research. When these have given so much we might well be less niggardly with our small change and cease the practice of distributing, not good wholesome intellectual bread, but the mere stones of

knowledge, the hard fossils of what were once stimulating thoughts. In the ancient world the Eleusinian mysteries were withheld from the crowd and knowledge was the possession of a few. Do the latter day priests of science desire to imitate the attendants of the old Greek temples and confine their secrets to a few of the elect by the use of a formalism which is the mere abracadabra of speech? Among certain scientific men there is a feeling that scientists should address themselves only to fellow scientists, and that to become an expositor to the unlearned is to lose caste among the learned. It is the survival of the narrow spirit of the dark ages, before modern science was born. There are not many, however, who dare confess to such a creed, although their actions may occasionally endorse it. On the whole, modern science is nothing if not catholic in its generosity. 'To promote the increase of natural knowledge and to forward the application of scientific methods of investigation to all the problems of life' was the avowed purpose of the greatest of the philosophers of the Victorian era.

There are those who are full of a similar good will, but they fail in giving effect to it because they are unable to use language which can be widely understood. In its very infancy geology was nearly choked with big words, for Lyell, the father of modern geology, said, seventy years ago, that the study of it was 'very easy, when put into plainer language than scientific writers choose often unnecessarily to employ.' At this day even the publications of the Geological Surveys of the United States and the Australian colonies, for example, are occasionally restricted in usefulness by erring in this respect, and as I yield to none in my appreciation of the splendid service done to geology and to mining by these surveys, I trust my criticism will be accepted in the thoroughly friendly spirit with which it is offered. It seems to me that one might almost say that certain of these extremely valuable publications are 'badly' prepared because they seem to overlook the fact that they are, of course, intended to aid the mining community in the first place and the public, whether lay or scientific, only secondarily. From a wide experience among those engaged in mining I can testify that a large part of the literature thus prepared is useless to them and that no one regrets it more deeply than they, because there is a marked tendency among this class of workers to appreciate the assistance which science can give. Take, for example, a sentence like the following, extracted from one of the recent reports of the U. S. Geological Survey. "The ore forms a series of imbricating lenses, or a stringer lead, in the slates, the quartz conforming as a rule to the carunculated schistose structures, though occasionally breaking across laminæ, and sometimes the slate is so broken as to form a reticulated deposit." This was written by one of our foremost geologists and, when translated, the sentence is found to convey a useful fact, but is it likely to be clear to anyone but a traveling dictionary? A thoroughly literary man might know the exact meaning of the two or three very unusual words which are employed in this statement, but the question is, will it be of any use whatever even to a fairly educated miner, or be understood by those who pay for the preparation of such literature, namely, the taxpayers? An example of another kind is afforded by a Tasmanian geologist who recently described certain ores as due to 'the effects of a reduction in temperature of the hitherto liquefied hydroplutonic solutions, and their consequent regular precipitation.' These solutions, it is further stated, presumably for the guidance of those who wield the pick,

'ascended in the form of metallic superheated vapors which combined eventually with ebullient steam to form other aqueous solutions, causing geyser-like discharges at the surface, aided by subterranean and irrepressible pressure.' At the same time certain 'dynamical forces' were very busy indeed and 'eventuated in the opening of fissures'—of which one can only regret that they did not swallow up the author as Nathan and Abiram were once engulfed in the sight of all Israel.

It will be well to contrast these two examples of exuberant verbosity because the first befogs the statement of a scientific observation of value, made by an able man, while the second cloaks the ignorance of a charlatan, who masquerades his nonsense in the trappings of wisdom. Here you have an illustration of the harmfulness of this kind of language, which obscures truth and falseness alike, to the degradation of science and the total confusion of those of the unlearned who are searching after information.

Let the writer on scientific matters learn the derivation of the words he uses and then translate them literally into English before he uses them, and thereby avoid the unconscious talking of nonsense. If he knows not the exact meaning of the terms which offer themselves to his pen, let him avoid them and trust to the honest aid of his own language. 'Great part of the supposed scientific knowledge of the day is simply bad English, and vanishes the moment you translate it,' says Ruskin. The examples already given illustrate this. 'Every Englishman has, in his native tongue, an almost perfect instrument of literary expression,' so says Huxley, and he illustrated his own saying. Huxley and Ruskin were wide apart in many things and yet they agreed in this. Ruskin proved abundantly that the language of Shakespeare and the Bible can be used as a weapon of expression keen as a Damascus saber when it is freed from the rust of classic importations, which make it clumsy as a crowbar.

There is yet another reason against the excessive use of Greek-English words, in particular. Greece is not a remnant of extinct geography, but an existing land with a very active people and a living language. The terms which paleontology has borrowed from the Greek may be returned by the Greeks to us. And, as Ruskin points out, "What you, in compliment to Greece call a 'Dinotherium,' Greece, in compliment to you, must call a 'Nasty-beastium,' and you know the interchange of compliments can't last long."

In all seriousness, however, is it too much to ask that such technical terms as are considered essential shall not be used carelessly, and that in publications intended for an untechnical public, as are most government reports, an effort be made to avoid them and, where unavoidable, those which are least likely to be understood shall be translated in footnotes. Even as regards the transactions of scientific societies, I believe that those of us who are active members have little to lose and much to gain by confining the use of our clumsy terminology to cover ideas which we cannot otherwise express. By doing so we shall contribute, I earnestly believe, to that advancement of science which we all have at heart.

The words which, at first, are the exclusive privilege of the specialist, gradually extend into wider use, following in the wake of that diffusion of scientific knowledge which is one of the objects of this Association. We believe that to get alongside facts, to apply the best knowledge available, to seek truth for its own sake, is as essential to the well-being of the individual life as it is to the success of a

machine shop, and as beneficial to the community as it is to a smelting works.

In furtherance of this principle we must remember that language in relation to ideas is a solvent, the purity and clearness of which affect that which it bears in solution. Whewell, in 'The Philosophy of the Inductive Sciences,' has expressed this view of the matter with noble eloquence. 'Language,' he said, 'is often called an instrument of thought, but it is also the nutriment of thought; or rather, it is the atmosphere in which thought lives; a medium essential to the activity of our speculative powers, although invisible and imperceptible in its operation, and an element modifying, by its qualities and changes, the growth and complexion of the faculties which it feeds.'

In considering the subject from this standpoint, there is borne in upon the mind a suggestion which carries our thought far beyond the confines of the matter under discussion. Such power of speech as man possesses is a faculty which appears to divide him from all other living things, while at the same time the imperfection of it weighs him down continually with the sense of an essential frailty. To be able to express oneself perfectly would be divine, to be unable to make oneself understood *is* human. In 'Man's Place in Nature,' Huxley points out that the endowment of intelligible speech separates man from the brutes which are most like him, namely, the anthropoid apes, whom he otherwise resembles closely in substance and in structure. This endowment enables him to transmit the experience which in other animals is lost with each individual life; it has enabled him to organize his knowledge and to hand it down to his descendants, first by word of mouth and then by written words. If the experience thus recorded were properly utilized, instead of being largely disregarded, then man's advancement in knowledge and conduct would enable him to emphasize, much more than it is permitted him at present, his superiority over the dumb brutes. Considered from this standpoint language is a factor in the evolution of the race and an instrument which works for ethical progress. It is a gift most truly divine which should be cherished as the ladder which has permitted of an ascent from the most humble beginnings and leads to the heights of a loftier destiny, when man, ceasing to stammer forth in accents which are but the halting expression of swift thought, shall photograph his mind in the fulness of speech, and, neither withholding what he wants to say nor saying what he wants to withhold, shall be linked to his fellow by the completeness of a perfect communion of ideas.

T. A. RICKARD.

DENVER.

SCIENTIFIC BOOKS.

Geschichte der Metalle. Vom Verein zur Beförderung des Gewerbfleisses mit dem ersten Tornow-Preise gekrönte Preisschrift. Von ADELBERT RÖSSING. Berlin, Verlag von Leonhard Simon. 1901. 8vo. Pp. vi + 274.

This 'History of Metals' forms a great contrast to the 'History of the Precious Metals' by Alex. Del Mar, reviewed in SCIENCE for December 6, 1901. The latter, as we have shown, is a philosophic study of the sources and history of the *two* metals, silver and gold, the work under review deals with the occurrence (in nature), the history of discovery the chemical, metallurgical and electrical preparation, the statistics of production and the cost price of *all* the known metals, fifty-five in number. Dr. Rössing's treatise forms, consequently, a most timely and valuable complement to that by Del Mar.

The arrangement of matter is very convenient for reference; after an introduction occupying twenty-one pages, the metals are discussed in alphabetic order, the treatment

being as indicated above, but limited by circumstances in many instances. The metals that have been in use from earliest times, either in native state or in ores, naturally occupy more space than those of comparatively recent origin; especially since in the former class is included the development of metallurgical operations used at different periods to make the metals available.

The occurrence in nature of many of the metals is very fully shown by lists of localities and of ores, or minerals, the latter accompanied in many cases by formulæ giving their chemical composition. References to authorities cited occupy footnotes on nearly every page, and as an example of their thoroughness may be mentioned a note calling attention to a 'peculiarly American and wonderful' company for extracting gold from sea-water, formed in Connecticut. The history and exposure of this fraud is well known to the readers of SCIENCE.

In sketching the history of processes for extracting metals from their ores, the modern extensive application of electricity has not been neglected, especially with reference to aluminium, antimony, gold, copper, silver and zinc. In this connection German, British and American patents are occasionally cited.

Unusual forms or conditions of some metals are named, and their chemical preparation described—colloidal mercury discovered by Lottermoser, and Leo's colloidal silver, but the researches of Carey-Lea seem to be unknown to the author.

Among the most valuable features of this work should be mentioned the statistics of production and the prices; when possible the figures are given for the entire nineteenth century in five-year averages; and a study of them brings out some striking features. The contrasts in production and price of aluminium are especially notable; from 1858 (three years after the labors of St. Clair Deville had made it an article of commerce) to 1884 a kilogram of aluminium was quoted at 100 marks, during the year 1890 the price per kilo fell from 27.6 to 15.2 mks., and in the following year it fell to 5 mks.; the price in 1897 was 2.5 mks., and the output amounted to three and four tenths millions of kilos, of which nearly two millions were produced in the United States. Sodium was quoted at 32.5 mks. per kilo in 1866, and at 5 mks. in 1897. Manganese has suffered an extraordinary fall in price, showing that as soon as an article is positively demanded by commerce, means for securing it cheaply are devised; in 1886 manganese was quoted at 550 mks. per kilo, and four years later at 40 mks.; it fell in 1896 to 16 mks. per kilo.

The price of metallic sodium in 1879 was 20. mks. per kilo, and it had fallen to 5 mks. in 1897. Some metals of minor importance maintain a relatively uniform price, as antimony and palladium; while that of platinum has risen from 500 mks. per kilo in 1870 to 1297 mks. in 1895, and largely owing to the demand made for it by electrical apparatus.

In pleasing contrast to these rapid fluctuations in price is the steady behavior of the king of metals—gold; the figures (in part) are as follows:

1801–05,	2736.8	mks.	per	kilo.
1846–50,	2736.3	"	"	"
1876–80,	2730.7	"	"	"
1891,	2736.3	"	"	"
1892,	2743.2	"	"	"

The important bearing of this is obvious to students of monetary science.

The author is to be commended for the pains he has taken to prepare a valuable work of reference; the reviewer regrets that he feels obliged to point out a blemish in the manufacture of the volume, for which the publisher is primarily responsible. The running-head lines, particularly important in a dictionary or a book on the alphabetic plan, have been omitted and their place is inadequately filled by the page numbers; this makes it difficult to find a given metal readily, although in alphabetic order, except by scanning the text closely on a given page, or by examining the table of contents. This economy by publishers is to be deprecated. HENRY CARRINGTON BOLTON.

Practical Marine Engineering, for Marine Engineers and Students, and with Aids for the Applicants for Marine Engineers' Licenses. By WM. F. DURAND, Professor of Marine Engineering, Cornell University. New York, Marine Engineering Co. 8vo.

It too seldom occurs that men of high attainments and experts in their professions, possessed of both technical and scientific, practical and 'theoretical,' knowledge, are either able or willing to give time and thought to the production of works of this sort, and the task of provision of much-needed text-books and hand-books is too generally left either to the man of science without expert knowledge in the practical field or to the practitioner lacking sound and extensive scientific culture and training. This, which is a text-book for those desiring to secure practical knowledge of marine engineering with, at the same time, accurate understanding of its scientific foundations, is a model which it is to be hoped will furnish stimulus to many other able men in as many other departments. Its field is well laid out, its scheme and details well planned and handled and it is concise, simple, clear and satisfactorily full. Dr. Durand is an authority in his department, expert in its practice and familiar with its scientific basis, accustomed to combine science with practice, an experienced engineer, a trained and successful educator. The book is authoritative and cyclopedic and in it practical marine engineering is reduced to its simplest and most exact terms.

Its chapters discuss the materials of engineering, including the fuels, their methods of preparation and production, and their characteristics and qualities; boilers and their construction; marine engines, auxiliaries and accessories, their operation, management and repair. Special topics and problems illuminate and render usefully applicable the principles enunciated, and the second part of the work is devoted particularly to 'Computations for Engineers,' carefully selected and skilfully solved problems.

The introduction on board the modern steamship of refrigerating and other special machinery leads to the study, in appropriate chapters, of the apparatus of electric light and power distribution and of refrigeration, their care and management. These chapters are admirably concise and yet complete for their purpose.

The book is well made, the type excellent and the illustrations clear and freely supplied, especially as illustrating the details of construction of marine machinery. So far as can be seen at a first review of its contents, the book is thoroughly up to date and very accurate, a credit alike to author, publisher and printer. It has its origin, apparently, in the public spirit and enterprise of the publishers of the technical journal, *Marine Engineering,* under whose imprint it appears.

R. H. T.

Studies in Physiological Chemistry. Edited by R. H. CHITTENDEN, Ph.D. New York, Scribner's Sons. 1901.

This volume of 424 pages, one of the Yale Bicentennial publications, contains reprints of the more important studies issued from the laboratory of physiological chemistry of Sheffield Scientific School of Yale University, during the years 1897–1900.

The twenty-six papers, representing the work of Professor Chittenden and his pupils during this time, are simply reprints from the *American Journal of Physiology,* the *Journal of Experimental Medicine* and *Zeitschr. f. physiol. Chemie,* Bd. XXIX., and form a valuable sequel to the three volumes of studies previously issued from this laboratory in 1885, 1887 and 1889. A complete bibliography of the Sheffield Laboratory of Physiological Chemistry from its commencement in 1875 until the end of the year 1900 is also given.

As these studies are more or less familiar and as they have been reviewed in the original, it is hardly necessary to enter into any detailed criticism of them. In viewing the work coming recently from this laboratory, one is struck with the radical change in direction in the line of research from the earlier investigations. It would be most interesting to have researches from the Sheffield laboratory on the products of proteolysis, in view of the recent researches of Kutscher, Siegfried, Balke, Lawrow, Pick and others. This line of work, so ably carried out by Kühne and Chittenden in 1883–4, has undergone such radical modifications in latter years that the views and investigations of one of the

pioneers would be most valuable to science. Although Professor Chittenden attempts to reconcile his views in regard to antipeptone with modern investigations, in an addendum to 'a chemico-physiological study of certain derivatives of the proteids,' page 321, still we think he fails to make his point very clear.

JOHN A. MANDEL.

Primitive Man. By DOCTOR MORIZ HOERNES. Translated into English by JAMES H. LOEWE, London, 1900. Dent and Co. Pp. 136, Figs. 48.

This handy little 16mo volume forms the twenty-third number in the series of Temple Primers designed by the publishers to furnish, for a shilling a copy, the best and latest results of scholarship to the average reader who cannot afford the costly encyclopedias. Beginning with the subject of man's place in nature the author sums up the characteristics of culture, the earliest traces of man, the ages of stone, bronze and iron; and the primitive history of the Aryans and Semites. Small space is given to the Western Hemisphere, but that is fortunate in two ways, for some wild guessing has been done on that topic, and, secondly, American readers will be glad to have a handy little guide book to European archeology. Not one American authority is mentioned in the bibliography and no European work later than 1894.

O. T. MASON.

Anleitung zur mikroskopischen Untersuchung der vegetabilischen Nahrungs- und Genussmittel. By DR. A. F. W. SCHIMPER, ö. Professor der Botanik an der Universität Basel. Second revised edition. Jena, Verlag von Gustav Fisher. 1900.

A melancholy interest attaches to the consideration of this book owing to the recent death of Dr. Schimper in the prime of life. Here in a space of 150 pages we have a very attractive and useful introduction to the microscopic appearance of flours, starches and their adulterants; of coffee and its adulterants; cocoa, chocolate, tea, tobacco, pepper, cloves, allspice, red pepper, mustard, saffron, cinnamon, vanilla, cardamon, nutmeg, mace, ginger and turmeric. There is also a chapter on the adulterants of fruit jellies, and one on honey. The book contains a good index and 134 figures, which are well drawn and very attractive. Among the substances used for adulterating coffee Schimper mentions the following: Chickory, beets, carrots, figs, various cereals, lupin seeds, acorns, carobs, dates, vegetable ivory, potatoes. These are described in a space of twenty pages with seventeen illustrations. Under fruit jellies, we learn that agar-agar is frequently employed for their adulteration and that this substance may be detected readily by means of the microscope, owing to the fact that these seaweeds always have numerous diatoms clinging to their surface, as any one may determine readily by burning a small quantity of agar-agar in a platinum dish, adding to the ashes a few drops of water rendered acid by HCl and then examining under high powers of the microscope. When jellies are suspected of adulteration with agar-agar, the author recommends that the mass of jelly be boiled with about five per cent. dilute sulphuric acid, and then that a few crystals of permanganate of potash be carefully added. The previously suspended diatom shells now fall to the bottom and form a more or less rich sediment, which may be examined without any further preparation.

In this age of haste to be rich at any cost, the extension of the adulteration of food products has become very great, and the knowledge contained in books of this kind increases yearly in importance, not only to the special worker, but to the general public. The moderate price of four Marks in paper covers, or five Marks, bound, puts the book within the reach of every one.

ERWIN F. SMITH.

Use-Inheritance illustrated by the Direction of Hair on the Bodies of Animals. By WALTER KIDD, M.D., F.Z.S. London, Adam and Charles Black. 1901.

This is an interesting contribution to the dynamic or Lamarckian principles of evolution. Dr. Kidd has first treated of the formation of whorls in the hairy coats of mammals; and second, the slope of hair in certain selected regions of the bodies of animals and

man. In the domestic horse there are five regions where whorls occur—*i. e.*, the frontal, inguinal, pectoral, post-humeral or axillary, and cervical. These are due, the author shows, to the traction of the underlying muscles. It is interesting to observe that they are absent in the zebra, and are apparently the result of the movements and work done by the horse in a state of domestication. 'It is difficult,' the author concludes, 'to see any explanation of the formation of whorls, featherings and crests in the hairy coats of mammals other than a dynamical one.' His reasons for the dynamical view are as follows:

1. They all occur, except that on the vertex, in regions where opposing traction of underlying muscles is found.

2. They never occur over the middle of a large muscle, and seldom in any place where there is not a hollow or groove in the superficial anatomy.

3. They are most uniform and most marked in animals with very strong muscles, and those that are actively locomotive.

4. Their constancy appears to depend upon range of action and activity of function of the muscles in the part and individual animal affected. This is especially shown in the three regions of the domestic horse—pectoral, post-humeral and inguinal.

As regards the hair slope, the author arrives at the following conclusions:

1. To understand the disposition of hair on living animals, it is necessary to look upon it as a stream, and this is very plastic.

2. In man, and various groups of animals, the great majority of the peculiarities here noted are congenital.

3. Certain peculiarities of hair-slope are at present in process of development.

4. The hair streams are disposed in the lines of least resistance.

5. The mechanical conditions required for the production of both the general and the special hair-slopes are in present operation.

6. The hair-slope can be modified during the life of an individual.

7. Selection (whether natural, sexual or germinal) is incompetent to produce these peculiarities of hair-slope.

8. If these are not originally created with the forms of life which present them, they must have been produced in ancestors by use or habit.

The author seems to have made out a good case and to have been led by the legitimate use of the inductive method to what seem to be valid and natural conclusions.

A. S. P.

Some Fossil Corals from the Elevated Reefs of Curaçao, Arube and Bonaire. By T. WAYLAND VAUGHAN. Sammlungen des Geologischen Reichs-Museums in Leyden, Ser. 11, Bd. 11, Heft. 1901.

Mr. Vaughan makes his report upon the fossil corals from the Dutch West Indies, collected by Professor K. Martin, director of the Leyden Geological Museum, part of an elaborate study of the history and synonymy of the West Indian corals. The paper is companion to another by the same writer, shortly to appear, upon the stony corals of Porto Rico collected by the recent survey of the U. S. Fish Commission. The latter will contain photographic reproductions of most of the living species of West Indian corals. Both papers are subsidiary to a larger work upon the post-Eocene Corals of the United States, now in the course of preparation.

The author is preeminently qualified for the task he has undertaken. In addition to having access to the large accumulations of corals at the U. S. National Museum and Geological Survey, including the type specimens of Dana, he has visited the collections in London, Paris, Berlin, Turin and other centers, where are contained the types of Milne-Edwards and Haime, Ehrenberg, Klunzinger, Duncan, Duchassaing and Michelotti, and other workers on the corals. In some way the present revision is a continuation of the work of Professor J. W. Gregory on the fossil corals of Barbados.

The result is what might have been expected. With the further accumulation of material for study, enabling the possible variations within the limits of a species to be estimated, and the comparison of the type specimens of different investigators, either side by side, or by the aid of photographs, it

has been possible to bridge over a large number of the gaps which separate certain so-called species, and to demonstrate that many of the latter are but varieties of growth in a somewhat protean group. Thus, to take a couple of instances: *Orbicella acropora* (Linnæus) now embraces ten species, and has been known under the same number of genera; *Meandrina meandrites* (Linnæus) has a synonymy in which are represented seven genera and thirteen species.

Unfortunately the revision of the synonymy reveals the necessity for several important changes in long-established names if the rules of nomenclature are to be strictly followed. Vaughan now shows that the true *Meandrina* is not the brain coral which students, from the time of Milne-Edwards, have been accustomed to associate with the name, but is the *Pectinia* of Milne-Edwards, while the *Meandrina* of the 'Coralliaires' has for the future to be known as *Platygyra*. It is with a sigh that one relinquishes *Madrepora* for the corals so long associated with this name. As was first pointed out by Geo. Brook, in the British Museum Catalogue of the Madreporaria, none of the species at present included under *Madrepora* were embraced by Linnæus when he instituted the term in 1758. Vaughan now suggests its replacement by *Isopora*, a name first used in the subgeneric sense by Studer in 1870.

The writer follows Brook in regarding all the forms of the West Indian *Madrepora* as but one species, the three Lamarckian species —*palmata, cervicornis* and *prolifera*—being reduced to formæ or varieties. Gregory in 1895 had come to the same conclusion as Brook, but in 1900, following upon a visit to the West Indies, and the opportunity of seeing the different representatives in situ, he reverts to the Lamarckian arrangement, and endeavors to dispose of the specimens which Brook regarded as intermediate in form.

In the immense coral flats around the various Antillean islands the three types of *Madrepora* growth usually retain a remarkable distinctness of form, though often growing side by side; and from a study of these alone one would be far from induced to admit their specific unity. The polyps, however, are practically alike in form and color, and anatomically and histologically they reveal no important differences. Vaughan also believes that he possesses colonies which should be regarded as intermediate in habit between the three recognized types. In his forthcoming Porto Rican paper the author proposes in like manner to unite under two groups the many and varied West Indian representatives of the allied genus *Porites*.

It might have been supposed that the study of the polyps themselves, both in their living condition and anatomically and histologically, would have revealed distinctions tending to strengthen the specific separations founded upon the skeletal form. But such is not the case. A comparative study of the polyps of many so-called species of *Madrepora, Porites, Orbicella,* etc., now in progress reveals very few differences within each genus. Compared with those of *Madrepora* the polyps of *Porites* vary greatly in color, often on the same colony, but except for slight variations in size no other differentiations of importance can be established in any part of their structure.

Extensive studies like those now being undertaken by Vaughan indicate that the greater the number of specimens of Madreporarian corals which are studied, with regard both to the skeleton and soft parts, the greater will be the tendency to lessen the number of species. As it has been expressed by the author: "The number of species is very often a function of the amount of the material studied." The same tendency has already reached its climax in the case of the Hydrozoan coral, *Millepora*. In the course of a study of both polyps and skeleton of this genus, extending over many years, and embracing specimens from all parts of the world, Professor Sidney Hickson has recently come to the conclusion that it is impossible to maintain any specific distinction. All the numerous skeletal forms, hitherto included under about thirty-nine names, are, from Hickson's researches, to be regarded as but so many varieties of growth, which presumably may be assumed by any one individual under like conditions.

Zoologically the tendency is healthy. For the student's time will be set free to investigate collections of specimens from other standpoints than that of assigning each its name, animated by the desire to produce the longest possible list. Variations in a form will be studied as modifications adapted to particular environments. In museums the specimens can then be arranged, not as objects with so many long names as appendages, but as illustrating vital principles of natural history.

J. E. DUERDEN.

JOHNS HOPKINS UNIVERSITY,
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GENERAL.

A NEW edition of Stieler's Handatlas to contain 100 copper-plate maps is now in course of publication by Perthes of Gotha, in fifty parts; the price of the complete work being 30 Marks. Half the maps are newly projected and engraved. All of them have relief in brown, in order to make the names in black more legible. In preparation for binding, each sheet has its title printed on the right corner of the back, with on outline map that indicates the location of the sheet and of the neighboring sheets with their numbers. The present edition is the ninth of this valuable work; the first having been completed by Stieler in 1831. Later editions were by Stülpnagel. Petermann, Berghaus and Vogel.

SCIENTIFIC JOURNALS AND ARTICLES.

THE January (opening) number of Vol. III. of the *Transactions of the American Mathematical Society* contains the following papers: 'On a Class of Automorphic Functions,' by J. I. Hutchinson; 'Concerning the Existence of Surfaces Capable of Conformal Representation upon the Plane in such a Manner that Geodetic Lines are Represented by a Prescribed System of Curves,' by H. F. Stecker; 'Zur Erklärung du Bogenlänge und des Inhaltes einer krummen Fläche,' by O. Stolz; 'The Groups of Steiner in Problems of Contact,' by L. E. Dickson; 'Quaternion Space,' by A. S. Hathaway; 'Reciprocal Systems of Linear Differential Equations,' by E. J. Wilczynski; 'On the Invariants of Quadratic Differential Forms,' by C. N. Haskins; 'The Second Variation of a Definite Integral when One End-point is Variable,' by G. A. Bliss; 'On the Nature and Use of the Functions Employed in the Recognition of Quadratic Residues,' by E. McClintock; 'A Determination of the Number of Real and Imaginary Roots of the Hypergeometric Series,' by E. B. Van Vleck; 'On the Projective Axioms of Geometry,' by E. H. Moore.

THE December number (Vol. VIII., No. 3) of the *Bulletin of the American Mathematical Society* contains the following articles: 'The October Meeting of the American Mathematical Society,' by Edward Kasner; 'Modern Methods of Treating Dynamical Problems and in Particular the Problem of Three Bodies,' by E. W. Brown; 'The Hamburg Meeting of the Deutsche Mathematiker-Vereinigung,' by C. M. Mason; 'Some Curious Properties of Conics Touching the Line Infinity at One of the Circular Points,' by E. V. Huntington and J. K. Whittemore; 'Picard's Traité d'Analyse,' by Professor Maxime Bôcher; 'Errata,' 'Notes' and 'New Publications.' The January number of the *Bulletin* contains: 'Note on Mr. George Peirce's Approximate Construction for π,' by Emile Lemoine; 'Concerning the Elliptic $\wp(g_2, g_3, z)$-Functions as Coordinates in a Line Complex, and Certain Related Theorems,' by H. F. Stecker; 'On the Abelian Groups, which are Conformal with Non-Abelian Groups,' by G. A. Miller; 'The Infinitesimal Generators of Certain Parameter Groups,' by S. E. Slocum; 'Shorter Notices'; 'Notes' and 'New Publications.'

SOCIETIES AND ACADEMIES.

CHEMICAL SOCIETY OF WASHINGTON.

THE 130th regular meeting was held December 12. The following program was presented:

'The Solubility of Mixtures of Sodium Chloride and Sodium Sulphate': A. SEIDELL.

The author first gave a brief summary of the status of solubility work in solutions other than very dilute ones, and described in detail the experimental difficulties which have to be met in this kind of work. He then presented

a diagram illustrating the solubility curves for the system $NaCl—Na_2SO_4—H_2O$ at 10°, 21.5°, 25°, 27°, 30°, 33° and 35°. It was shown that at temperatures above 33° the curves represented equilibrium conditions between sodium chloride and anhydrous sodium sulphate, and no abnormalities presented themselves. Between 33° and 17°, however, it was found that in solutions containing but small amounts of sodium chloride and in contact with solid sodium sulphate, the equilibrium conditions were determined by the solid salt being in the form of the decahydrate, and the solubility curves for this decahydrate are very much flatter than the corresponding curves for the anhydrous salt. But as the amount of sodium chloride in the solution increased, at temperatures between 33° and 17°, there was always a sudden change in the direction of the solubility curve for sodium sulphate, which was found to be caused by the sodium sulphate present as solid phase, having gone over to the anhydrous form. In order to check this view, the experiment was made of placing large well-formed crystals of sodium sulphate decahydrate in two test-tubes, one containing a saturated solution of sodium sulphate alone, and the other a solution nearly saturated with sodium chloride, as well as sodium sulphate. Both test-tubes were fitted with cork stoppers carrying thermometers. They were then immersed in a water-bath and the temperature gradually raised. At 28° the crystals in the sodium chloride solution gradually became opalescent around the edges, then rather rapidly became entirely opaque and showed a tendency to fall apart in a loose powder. The material had undoubtedly gone over to the anhydrous salt, although the crystals which were in the tube containing only water and sodium sulphate showed no change until the temperature reached 33°. It thus appeared that the transition temperature for the change of sodium sulphate decahydrate to anhydrous salt had been displaced by the presence of sodium chloride. This was regarded as of considerable significance, and is important in connection with the suggestions on this subject in the study of the change of gypsum to calcium sulphate hemihydrate, made by Van't Hoff and Armstrong, Vater and Cameron.

The solubility curves for sodium sulphate heptahydrate in solutions of sodium chloride were shown to be very similar to those for the decahydrate. In the case of the decahydrate at lower temperatures and the heptahydrate, the curves were shown to have minimum points, the significance of which is not apparent at the present time.

'The Evolution of Metallic Retorts' (with samples): W. H. SEAMAN.

Before commencing the paper the speaker showed a very perfect copy, just received from England, of Boerhaave's 'New Method of Chemistry,' in two volumes, second edition, 1741. Boerhaave was born in 1668, died in 1738, was famous as a physician, botanist and chemist, and was one of the first to recognize the independence of the latter science.

The first metallic retorts were copper flasks just like the olive-oil flasks of the early chemists with a gallows screw added. In a lot of scrap of Professor Henry's apparatus about to be sold thirty years ago, the author found two wrought-iron retorts with walls a centimeter thick, and shaped just like a glass tubular retort that are types of this class.

The next retort exhibited was a pear-shaped vessel. It had a feed wheel on top, and was set in an egg stove, the bottom made red hot and $KClO_3$ fed in by the wheel. The O was taken off by the side pipe.

Next was a kettle-shaped retort patented by the author. Its peculiarity is that all parts draw together by the gallows screw, while the top is durable with ground joint, and the bottom, being thin, heats quickly and can be cheaply renewed.

Next we have the cylindrical sheet metal retort which admits of moving the bunsen burner along its length so as to decompose the charge in successive portions.

The latest development is the little frustrum of a cone, with gallows screw top and two pipes, one for delivery and one for the introduction of an inert gas or other purpose that may be desired. In this oxygen may be made, coal distilled, etc. They are sold by the Chicago Laboratory Supply Co., price one

dollar, and are one of the most useful acquisitions we have lately had made to laboratory apparatus.

'Starch as an Adulterant or Drier in Butter, and a Study of Glucose in Butters': G. E. PATRICK and D. STUART.

1. The paper describes first a canned butter which was found to contain, besides about 15 per cent. of glucose, 3.15 per cent. of starch, either potato starch or a variety closely resembling it. The starch was probably added as a drier; it is said to be sometimes used for this purpose in remanufactured butter. The complete analysis of this butter was: water, 27.19; fat, 40.36; ash, 12.65 (all NaCl except .65 impurities); casein (N x 6.25), 0.86; starch, 3.15; other organic matter, 15.8. Assuming .3 per cent. of lactose, there remains 15.5 per cent. of organic matter which was set down as glucose, since no other organic substance was identified. The aqueous extracts, of 100 cc. volume, from 26.05 grams of the butter, that is, a 'normal sugar solution,' polarized 26.2 degrees on the cane sugar scale (Soleil-Ventzke).

2. With four glucosed butters studied, whole 'normal sugar solutions' polarized respectively 7.0, 11.0, 18.5 and 26.2 degrees, and whose percentages of organic matter designated glucose (as in the case above) were respectively 7.0, 7.9, 10.6 and 15.5 per cent., the rotary and copper reducing powers of the aqueous extracts being referred to these amounts of dry matter, the copper reducing power was in every case (possibly excepting one) too low to correspond to the rotary power, according to Rolfe and Defren, if the entire matter were pure glucose. Sucrose was suspected and inversion was tried by means of saccharine, following the method of Tolman. In only two of the four cases was the rotation appreciably lowered. In these two—and these two butters were canned by the same firm—there was a marked reduction of rotation, indicating (of course not proving) the presence of cane sugar to the amount of about 1.3 per cent. on the butters. The increase of copper reduction, by inversion, was not determined at the time; but several weeks later, the small residual samples having been meantime at laboratory temperature, one was tested, and the increased copper reduction after inversion was found to correspond to .83 per cent. sucrose in the butter, while the decrease of rotation by inversion at this time corresponded to only 1.0 per cent. sucrose. As glucose is added to butters in the form of a sirup, and as there are upon the market glucose sirups containing admixture of cane sugar, the presence of the latter in a glucosed butter need not be so very surprising. Aqueous extracts, 'normal sugar solutions' of 49 non-glucosed butters polarized from 0 to .5 degree, averaging .22 degree. Five ladled butters out of 15 examined polarized from 3.4 to 5.7 degrees, showing admixture of glucose. Glucose is frequently used by ladlers to improve the appearance of their product.

L. S. MUNSON,
Secretary.

ANTHROPOLOGICAL SOCIETY OF WASHINGTON.

THE 324th meeting was held December 7. Mr. Paul Beckwith presented a type series of Philippine swords, from the National Museum, with description of their use, and stated the rank and people to which each sword belongs.

President W. H. Holmes presented some rare examples of ancient Mexican art, lately acquired by the National Museum. These consisted of pottery and stone carvings, showing exceptional artistic feeling in their treatment.

The paper of the evening was on 'Le Culte des Pierres en France,' by M. Paul Sebillot, translated and read by Mr. Jos. D. McGuire. Some months ago an arrangement was made between the Société d' Anthropologie de Paris and the Anthropological Society of Washington to exchange communications for one meeting during the winter. M. Sebillot's paper is the result of this intersociety comity. M. Sebillot has made extensive historical and observational researches on the great body of folk-lore and customs connected with the megalithic monuments of France, which really constituted a cult of stones coming down from ancient times. In general the customs are divinitory and may be grouped under the head of lithomancy, the idea being to look into the

future, for instance, the maids as to marriage and the matrons as to fecundity. On the whole the Cult des Pierres seems to be feminine. The strange customs long inhibited are still secretly practiced in France and M. Sebillot has handled this delicate subject with great detail and frankness. The paper was illustrated by a large series of photographs of the megalithic monuments, lent by Dr. Thomas Wilson.

Dr. J. Walter Fewkes in discussing the paper said that he appreciated this great contribution to knowledge, and further that a number of customs among the Zuni and Moki are similar to those mentioned by M. Sebillot. Mr. W J McGee and Dr. Thomas Wilson also discussed the question of the worship of stones in America.

The Society passed a vote of thanks to M. Sebillot and requested the publication of the paper in the *Anthropologist*.

Walter Hough.

DISCUSSION AND CORRESPONDENCE.

NOTES ON CUBAN FOSSIL MAMMALS.

To the Editor of Science: The reported occurrence in Cuba of certain fossil mammals has been used by several geologists, the first of whom was Manuel Fernandez de Castro, as evidence of former land connection between Cuba and the continent of North America in Pleistocene time.

The fossil mammals reported from this island belong to the genera *Hippopotamus, Equus, Mastodon* and *Megalocnus,* a subgenus of *Megalonix.* Leidy* examined specimens sent him by Poey, and published the opinion that the remains of the horse appear not to differ from the corresponding parts of the recent animal, and it is even doubtful if they are to be considered indigenous fossils. Concerning the hippopotamus remains, which consisted of isolated canines, he says that 'they probably also belong to the recent animal.' The same opinion was expressed by Pomel.† Vertebrate paleontologists do not consider isolated horse teeth sufficient data for the determination of species. So far as I have been able to glean from the literature, the remains of the so-called fossil horses from Cuba, reputed to be of Pleistocene age, are fragmentary, and therefore cannot be considered as possessing any paleontologic value. It has been shown that the *Mastodon** remains were not indigenous to Cuba, but were contained in a box of fossils from Honduras sent by del Monte to the Royal Academy of Sciences of Havana.

These notes seem to show conclusively that the three mammals considered above were not indigenous to the island of Cuba.

The fourth genus, *Megalocnus,* remains to be considered. According to de Castro's first notice,† this specimen was collected at Ciego Montero, a place noted for warm baths, in the jurisdiction of Cienfuegos, by José Figueroa, a young student of the Royal University. This reference is given as a quotation from a note read by Poey to the Havana Academy in 1861. I have not seen this note by Poey in print. The subsequent publications until 1892 are simply quotations of the above given locality. In the *Anales de la Real Academia de la Habana,* Vol. III., page 656, April, 1871, a note is inserted by Poey asking for information concerning the locality of certain large fossils which were sent to de Castro. On page 698 of the same volume it is stated that this box of fossils was sent by Leonardo del Monte to the Havana Academy of Sciences and contained three fossils from Honduras. According to the note of Poey‡ this box contained specimens of *Mastodon humboldti,* but Poey himself does not verify the locality whence the *Megalocnus* came.

As there have been so many extraneous fossils confused in the so-called Cuban fossil mammalian fauna, it has occurred to me that

* *Proc. of the Acad. of Nat. Sci. Phila.,* Vol. XX., 1868, pp. 179.

† *Comptes Rendus,* Paris, Vol. LXVII., 1868, p. 850.

* For note by Poey regarding the original locality of the *Mastodon, M. humboldti,* see *Anal. Real. Acad. Cien. Habana,* Vol. VIII., pp. 124–126, August, 1871.

† *Anal. Real. Acad. Cien Habana,* Vol. I., p. 58, Sept., 1864.

‡ *Anal. Real. Acad. Cien. Habana,* Vol. VIII., pp. 124–126.

the specimens of *Megalocnus* might have been contained in this box of fossils from Honduras, or they may have come from some locality not in Cuba.

The only evidence which seems to contradict this expression of doubt is that given by de la Torre* in his 'Observaciones Geológicas y Paleontológicas en la región central de la Isla (Cuba).' In this article additional localities, the vicinity of Cárdenas and between Santo Domingo and Sagua, are recorded. I am not able to express an opinion as to the correctness of these localities or on Torre's ability to determine fossil vertebrates. I am inclined to doubt because there has been so much error regarding those fossils concerning which we have subsequently been able to procure definite data.

The question which I wish here to bring to the attention of vertebrate paleontologists is: Are vertebrate fossils of the genus *Megalocnus* found in Central America, especially in Honduras?

A note may be added upon the question of the priority of the name *Megalocnus* Leidy, and *Myomorphus* Pomel. The note by Leidy was published in the *Proceedings of the Academy of Natural Sciences of Philadelphia,* Volume XX., pages 179–180. The date given at the bottom of the page is June–July, 1868. The article by Pomel was published in the *Comptes Rendus de l'Academie des Sciences,* Paris, Vol. LXVII., for the second half, July to December, 1868, pp. 665–668. This is the account of the proceedings of the session of Monday, September 28, 1868. Apparently Leidy's name antedates that of Pomel by several months.

The recent mammalian fauna of Cuba consists of only two genera, a rodent, *Capromys,* which possesses species in several other West Indian Islands. It is a peculiar genus, having its nearest relatives in the Octodont rodents of South America. There are no relatives at all on the North American continent. The other genus is a peculiar large insectivore, *Solenodon.* This animal is entirely different from anything found in any other part of America. It is most closely related to a genus, which is very different, found in Madagascar. If there had been any Pleistocene connection between North America and Cuba it would have inevitably caused a considerable similarity between the mammalian faunas of the two regions. However, none of the common mammalian types of the continent, such as cats, raccoons, hares, etc., are found in that island.

T. WAYLAND VAUGHAN.

SMITHSONIAN INSTITUTION,
December 18, 1901.

* *Anal. Real. Acad. Habana,* Vol. XXIX., pp. 121–124, August, 1892.

THE ENGLISH SPARROW IN NEW MEXICO.

FOR some time we have known of the presence of this bird at Raton and Las Vegas. I have now for the first time observed it at Albuquerque, the birds being fairly numerous in the immediate vicinity of the railway station.

T. D. A. COCKERELL.

SHORTER ARTICLES.

NEJED: AN ARABIAN METEORITE.

AMONG a considerable number of important specimens lately added to the Ward-Coonley Collection of Meteorites, now on display at the American Museum of Natural History in New York, is a mass or single bolide of iron from Western Australia called the Youndegin or Penkaring Rock Meteorite. It is one and one half feet in greatest diameter, and weighs between 300 and 400 pounds. Its companion piece, which is in the Royal Museum of Vienna, weighs 910 kilogrammes (half a ton) and is with Cranbourne, also from Australia, one of the largest two meteorites from the entire Eastern Hemisphere.

But of even more interest is the subject of the present notice: the Nejed Meteorite from Central Arabia. It is a siderite or iron meteorite, whose form is rudely triangular, flattened in its longest diameter, which is about fourteen inches, while its thickness below is eleven inches, and its breadth, or height, about nine inches. Its surface is completely and very handsomely covered with the pittings so frequent in meteorites, whether of iron or of stone. The sharpness of these depressions and the bright-

ness of the iron—with entire absence of weathering—are noticeable features, as strongly indicating the recentness of the fall. Nejed was a meteorite which fell in two masses, one of 131 pounds, the other of 136½ pounds. The former was brought to Europe in 1885, and was sold to the British Museum, where it has since been on display. Mr. Fletcher has given (*Mineralogical Magazine*, 1887) some interesting points as to its finding. It was brought to London by a Persian agent who delivered it at the Museum, at the same time submitting a letter from his Excellency Hajee Ahmed Khanee Sarteep, Ex-Governor General of Bunder Abbas, Persian Gulf, and Grand Vizier of Muscat. The letter sent from Bunshire, and with the Persian date 14th Di Koodah, 1301, A. H., says:

"In the year 1282, after the death of Mahomed, when Maime Faisole Ben Saoode was Governor and General-Commander-in-Chief of the Pilgrims, residing in a valley called Yakki, which is situated in Nagede (Nejed) in Central Arabia, Schiek Kolaph Ben Essah, who then resided in the above-named valley, came to Bushire, Persian Gulf, and brought a large thunderbolt with him for me, and gave me the undermentioned particulars concerning it.

"'In the spring of the year 1280, in the valley called Wadee Banee Kholed in Nagede, there occurred a great storm, with thunder and lightning; and during the storm an enormous thunderbolt fell from the heavens accompanied by a dazzling light, similar to a large shooting star, and it sank deep into the earth. During its fall the noise of its descent was terrific. I, Schiek Kolaph Ben Essah, procured possession of it and brought it to you, it being the largest that ever fell in the district of Nagede. These thunderbolts, as a rule, only weigh two or three pounds, and fall from time to time during tropical storms.'

"The above concludes the narrative of Schiek Kolaph Ben Essah. The said Schiek, who brought me this thunderbolt, is still alive and under Turkish Government control at Hoodydah near Jeddah. I myself saw in Africa, four years after the above date, a similar one, weighing about 135 pounds, to that which Schiek Kolaph Ben Essah brought to me.

"The Sultan of Zanzibar, Sayde Mazede, obtained possession of it and sent it to Europe, for the purpose of having it converted into weapons, as when melted and made into weapons they were of the most superior kind and temper. For this reason I have forwarded my thunderbolt to London, considering it one of the wonders of the world, and may be a benefit to science."

(Signed)

Hajee Ahmed Khanee Sarteep,

Ex-Governor of Bunder Abbas, and Grand Vizier of Muscat.

Any reader of the above letter will be impressed with its straightforward narrative, even though the writer gives credence to the popular idea—not at all confined to Arabia—that meteorites fall during thunder storms. His remark that thunderbolts in his country usually weigh only two or three pounds is also of an ingenuous naïveté not incompatible with truthful sincerity. There is a similarity like to that of general human nature—which marks tales of meteorites in every part of the world, the phenomena accompanying their fall, which are also strikingly similar, helping toward this. In this present case the meteorite itself was forthcoming to justify the narrative, and its fellow followed closely after: the piece which the Grand Vizier mentions having seen in Zanzibar and which the Sultan of Zanzibar, at that time also Sultan of Muscat (which district borders close upon that of Nejed), sent also to Europe to have converted into weapons. It reached London, and also went to the British Museum, where, they being already provided, Director Fletcher sent them with this second piece to Mr. James R. Gregory—a celebrated collector of meteorites, who promptly added it by purchase to his collection. From the heirs of Mr. Gregory I a few months ago obtained it, and gave it a place of honor, becoming its uniqueness, in the Ward-Coonley Collection. In view of the fact that Sayde Mazede, the Sultan of Zanzibar, duly received his weapons, and that they were *not* made from his meteorite, the story

that 'they were of the most superior kind and temper' has a rather amusing sound. It is well known to scientists that meteoric iron quite refuses to yield to successful forging—its grain being too 'short' for a durable cutting edge. The excellency of the weapons returned to the Sultan confirms the suspicion that his messenger pocketed the proceeds of the sale, yet had the grace to visit Sheffield for the swords and simitars. The two masses of Nejed were identical in composition, as they were closely similar in size, weight and general external appearance. When a polished section of this iron is etched with acid or with bromide-water its surface displays excellently the Widmanstätten figures, the straight long beams of Kamacite forming the approximately equilateral triangle pattern according with the octahedral crystallization of the mass.

Mr. Fletcher has analyzed the iron, and has shown its near similarity in composition to the iron of Trenton (Wisconsin), Toluca (Mexico) and Verchne Udinsk (Siberia). The relation of the four irons is as follows:

	Nejed.	Trenton.	Toluca.	V.Udinsk
Iron	91.04	91.03	90.74	91.05
Nickel	7.40	7.20	7.78	8.52
Cobalt	0.66	0.53	0.72	
Copper	trace	trace	0.03	
Phosphorus	0.10	0.14	0.24	trace
Sulphur	trace		0.03	trace
Insol. Residue	0.59	0.45	0.34	0.58
	99.79	99.35	99.88	100.15

This close similarity of composition in masses fallen in widely separated parts of our earth, at different dates, and coming perhaps from heavenly bodies infinitely distant from each other in space, is one of the many wonders revealed by these cosmic messengers. Lockyer has also shown that the spectra of the two meteorites, Nejed and Obernkirchen, closely agree as to both the number and the intensity of the lines. The specific gravity of the Nejed was determined by Fletcher at 7.863. Cohen and Brezina both speak of its very slight *veranderungszone*. This surface decomposition being less than 1 mm. in thickness, together with the general sharpness and brightness of the iron, lends probability to the story of the Arabian that Nejed was seen to fall. Indeed Fletcher says of it in his earliest description, "The mass is thus one of the small group of meteoric irons, numbering at most nine or ten, of which the fall has been actually observed; and of these it is the largest." But in a later paper he expresses doubt as to the fall having been seen. We at least know that it fell in some quite recent period, and at the point where it was found. And Nejed, attractive in its peculiar history, is also interesting as being like Veramin of Persia (described by the writer in the December number of the *American Journal of Science*), one of the isolated, outlying meteorites. The great countries of Arabia and of Persia have each received, so far as recorded, but one of these celestial gifts. India, of almost exactly the area of these two countries combined, has the full number of fifty. The density of population in the Indian peninsula has doubtless something to do with the observing of these falls and the preserving of the stones. But this cannot account for the enormous disparity of the meteoric distribution. Nejed remains a grand and unique representative of isolated individuality.

HENRY A. WARD.

ROCHESTER, N. Y.

PRECAUTION IN THE USE OF GASOLINE.

IN those laboratories where gasoline is in use, it is necessary to observe a certain precaution with regard to the employment of rubber tubing, to which so far as I know, attention has never been directed. This precaution is that tubing which has been in use on burners should not be used afterwards for conducting gases, unless it has been very thoroughly washed out, or left to stand for some time. Serious accidents may result if, for example, a piece of tubing which has been used for some time on a burner, is immediately connected to a gasometer containing oxygen, for transferring that gas to cylinders or flasks for experiments. It would be natural to suppose that in such a case the washing out of the gasoline would be complete enough after one had passed through the tubing a volume of

oxygen say two or three times as large as the capacity of the tubing itself. But under certain circumstances this is found to be by no means sufficient, as the following experiment illustrates.

Ten feet of thin-walled gray tubing having an internal diameter of one fourth of an inch, was used on a burner for half an hour, and was from there transferred immediately to a gasometer of oxygen; the gas was then allowed to pass through the tubing and fill over water a cylinder the capacity of which was 560 cc.

As might have been expected the gas so obtained in the cylinder exploded violently. The volume of such a piece of tubing is about 95 cc., and hence the gas drawn off would contain something less than one sixth of the mixed hydrocarbons.

A second cylinder was then drawn off, and when a taper was thrust into it an explosion was produced which was as violent as the first.

The third cylinder also exploded, though less violently; the fourth flashed back slowly to the bottom, and the fifth behaved like pure oxygen.

Thus in this case 2,240 cc. were used to wash out a tube whose volume was less than 100 cc. That is, the contents of the tubing were displaced more than twenty times before the gas was removed.

The experiment obviously points to a solubility of the gas in rubber, and this is not surprising in view of the ready absorption by rubber of the low-boiling paraffin hydrocarbons in the liquid state.

That a certain amount of gasoline is absorbed in rubber may also be shown by passing a piece of rubber tubing up into a tube filled with the gas and inverted over mercury. It is of course to be remembered that the gas supplied by such machines as that in use here (Springfield Gas Machine) consists of a mixture of the vapors of the hydrocarbons with a very considerable proportion of air, so that such absorption experiments as these can only be relative. An evident absorption takes place even with gasoline which does not show any abnormal behavior when conducted through the tubing; but when such behavior was manifested, the absorption was more than doubled.

The danger arising from this source lasts for only a short time after the gasoline tank has been filled; and indeed the results recorded above were obtained only twice, although four attempts were made immediately after the filling of the tank; this irregularity is probably due to the varying demands made upon the gasoline machine at different times.

The rubber tubing employed in the experiments was such as is furnished under the catalogue number 8012 by Messrs. Eimer and Amend. The gasoline was that supplied by the Gilbert and Barker Manufacturing Company; hence it is of normal quality; the phenomenon in question was observed both with the 86° and 90° products (degrees Baumé, equivalent to the specific gravities 0.66 and 0.65).

On the whole these observations point to the conclusion that gasoline of the kind described contains a small amount of more volatile components, which are given off mainly at first, and being perhaps more soluble in rubber than those which come over later, cause the abnormal behavior above described.

It would be interesting to know whether others who use gasoline have had occasion to notice this peculiarity.

A. P. Saunders.
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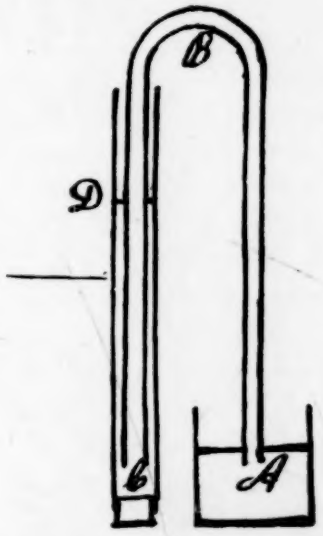
ON THE SIPHON.

The writer wishes to call attention to an error that has crept into the text-books on general physics, written for high school and university classes. Most of the books either state explicitly that a siphon will not work if the shorter of its two legs is longer than the column of liquid that would be supported by the air pressure, or else give explanations of the siphon, from which this follows as a legitimate conclusion. As a matter of fact, a siphon can be made to work and draw the liquid to a height considerably greater than that representing atmospheric pressure.

The writer usually illustrates this fact in his lectures by means of the following simple experiment: Let *ABC* in the figure be a glass

siphon tube, both legs of which are 10 cm. or 15 cm. longer than the barometric column. The bore of the tube should be small (about $\frac{1}{10}$ sq. mm.) to work well. Let one of the legs, *BC*, dip down into a larger tube *CD*, partly filled to *D* with mercury. Fill *ABC* with mercury, and start the siphon drawing mercury from *C* over to *A* in the usual way. In order to start the siphon the vertical height of *B* above the surface *D* of the mercury should be less than the length of a mercury barometer column, but as the flow continues, the mercury surface descends and keeps on descending until its vertical distance below *C* is considerably greater than this length.



To make this experiment work sufficiently well for demonstration purposes, excessive care in purifying the mercury and cleaning the glass is not necessary. Boiling the mercury in the actual tubes used, for instance, is superfluous. With ordinary redistilled commercial mercury and tubes cleaned with alcohol the writer has made the siphon work to a height of 70 cm. As the altitude of the University laboratory, where the experiment was performed, is a little over one mile, and the barometer pressure, therefore, only about 61 cm., this means that the siphon worked 9 cm. above the barometric height.

The most plausible explanation of the above fact is that the atmospheric pressure is not the only force pushing the mercury up the shorter leg. It is drawn up partly by the cohesive attraction of parts of the mercury for each other, and the column is kept from dwindling by the adhesive force exerted by the sides of the tube on the mercury.

It follows from the above that if a mercury siphon is placed under the receiver of an air pump, it can be made to work over a height of several centimeters, even though the air pressure is reduced to only a few millimeters. This experiment also has been shown to the writer's students. The apparatus was similar to that described above, except that the tubes were much shorter.

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FOSSIL SHELLS OF THE JOHN DAY REGION.

SINCE the publication about a year ago* of my paper on the 'Fossil Land Shells of the John Day Region,' etc., I have received from Professor John C. Merriam, of the University of California, a small collection of molluscan remains obtained by him in the same general locality. Professor Merriam's collection includes examples of the several species of land shells heretofore described,† namely, *Epiphragmophora fidelis anticedens, Polygyra Dalli, Ammonitella Yatesi præcursor* and *Pyramidula perspectiva simillima*. Of these four species there are numerous specimens and fragments. Dr. White's *Unio Condoni* apparently escaped detection. The foregoing represent all of the molluscan forms thus far reported from the John Day beds. Dr. White received his material from the late Professor E. D. Cope and Professor Thomas Condon, of the University of Oregon. Cope's specimens were obtained by Mr. Jacob L. Wortman, of the Army Medical Museum. These two collections included the same species.

Professor Merriam has made some interesting additions to the above brief list which are described below.

HELIX (EPIPHRAGMOPHORA?) DUBIOSA NOM. PROV.

Shell orbicular, flattened, discoidal, periphery angulated or obtusely carinated; whorls

* *Proc. Washington Acad. Science*, Vol. II., Dec. 28, 1900, pp. 651–658, pl. XXXV.

† Vide Dr. Charles A. White's paper 'On Marine Eocene, Fresh Water Miocene and other Fossil Mollusca of Western North America'; Bulletin No. 18, U. S. Geol. Survey, Washington, 1885, with two plates.

six or more, deeply sutured and exhibiting strong growth striæ. Apex whorls closely and slightly pitted. Aperture and umbilical region covered by a portion of the matrix in which the shell was imbedded.

Diameter (maximum), 24 mm., probably 26 to 26½ mm. when perfect. Elevation, about 10 mm. A sufficient portion of the shelly substance intact admits of the above description. Number of specimens, six; of these the individual described is the largest and most perfect. The smaller examples consist mainly of the upper whorls.

With more and better material it is quite probable the foregoing might prove to be an angulated, dwarfed, depressed aspect of the living *fidelis,* or *mormonum;* it also suggests the form known as *Hillebrandi.* Nearly all of the material is in a very unsatisfactory condition, with no color indications to assist in determination. While for these reasons the conclusions may be regarded as more or less arbitrary, the general character and relationship is believed to be fairly well pointed out.

PYRAMIDULA LECONTEI N. S.

Shell small, orbicularly depressed, widely and deeply umbilicated; whorls four and a half to five, rounded, closely and conspicuously ribbed except on the apex, which is nearly smooth; the ribbing extending into the umbilical cavity; the grooves between the ribs nearly as wide as the ribs are thick; the suture deep; aperture nearly circular or rounded lunate; edge of lip simple. Diameter (maximum), 8½ mm. Elevation, nearly 5 mm. A single example; the last whorl has been broken back somewhat; the maximum diameter was probably 9 to 9½ mm. The specimen appears to be scarcely mature. The number, prominence and regularity of the ribs make this a very pretty shell. The general facies suggests relationship with the extraordinary group of helicoid forms that are so widely distributed throughout the vast area denominated by Mr. W. G. Binney* the 'Central Province,' and listed by Dr. Pilsbry in his recent catalogue, as number 340† (*P. strigosa* and numerous races or varieties). A comparison of *P. Le-Contei* kindly made for me by Professor Dall, with the large series of the *strigosa* group in the National Museum, determines it, as he says, to be 'different from anything we have in the collection.'

In memory of the late Professor Joseph Le Conte, I have attached his name to the above form.

In addition to the species herein described, the material submitted to me by Professor Merriam included a small globose form about the size of a small pea; there are several examples, so disguised by adherent particles of matrix as to make it doubtful whether they belong to terrestrial or aquatic groups, with a presumption in favor of the first.

Partially exposed in portions of a fine compressed sediment of lacustrine origin are several casts of a very large *Limnæa,* suggestive in a general way of the circumboreal *L. stagnalis,* but so much distorted as to preclude a more definite description. For convenience this may be known provisionally as *L. maxima.*

Professor Merriam has now in preparation a paper on the paleontology of the John Day region, which will contain in detail the special data relating to the occurrence of the various forms above referred to as well as figures of the species I have described.

Robt. E. C. Stearns.

* 'Manual of American Land Shells,' Bull. 18, U. S. National Museum.

† 'Classified Catalogue of Land Shells of North America,' etc., Philadelphia, April, 1898.

CURRENT NOTES ON PHYSIOGRAPHY.

THE ISTHMUS OF PANAMA.

An essay on the 'Geology of the Central Portion of the Isthmus of Panama,' by Hershey (*Bull. Dept. Geol. Univ. Cal.,* II., 1901, 231–267), includes an account of the surface features in terms of the two chief cycles of denudation that have had effect there. The axial Cordillera de Veraguas, trending east and west, is described as a dissected plateau whose general surface, once a lowland of degradation, consisting in part of syenite and intrusive volcanic rocks, is now raised to an altitude of 3,000 feet. The valleys in it are deep, narrow, and steep-sided. Eliminating them, the district would be a high plateau with a width of 20 or 25 miles, arched a little along an east-west medial line, but otherwise

remarkably even. The ridges often have nearly level crest-lines for several miles, and rise to similar altitudes; and there are some extended flats at the height of the ridge tops. Southward from the mountains there is a lower and younger and much better preserved peneplain, uplifted a few hundred feet, sloping gently toward the sea and sharply trenched by young valleys 'the most beautiful and perfectly base-leveled land' that the writer has seen. The interfluves are very slightly arched and are remarkable for their long gentle slopes. Many low monadnocks rise above the plain, and these, together with a 10- or 20-mile belt of irregular ridges and peaks bordering the mountains, are taken to be the remnants of the older peneplain, here less preserved than in the harder rocks of the Cordillera. The border of the younger peneplain, determined by the ending of its gently undulating strata, is followed by a young coastal plain, trenched like the peneplain by narrow valleys and cliffed along the shore; here the interfluves are flat, instead of being gently arched as further inland. The coastal plain, as an area of marine deposition, is the equivalent of the younger peneplain as an area of subaerial degradation. On the northern side of the isthmus, a narrow, dissected peneplain slopes gently from the Cordillera to the seacoast. This plain bears auriferous gravels near the mountain base. The slopes of the two younger peneplains, north and south of the Cordillera, and the greater height that is believed to have been gained by the older peneplain along the mountain axis, suggest a repeated up-arching of the isthmus along an east-west line. A recent depression has occurred, especially noticeable along the southern coast, where there are several good examples of partly drowned valleys.

THE GRECIAN ARCHIPELAGO.

PHILIPPSON's latest studies in classic lands concern the Cyclades or southern island group of the Grecian archipelago ('Beitr. zur Kenntniss der griech. Inselwelt,' *Pet. Mitt. Ergänzungsheft,* 134, 1901, 172 pp., 4 maps). The islands are, in the most general statement, the remains of an old-mountain region (Rumpfgebirge) reduced to moderate but not faint relief, then elevated and much dissected by streams and waves during slow depression, finally more rapidly submerged and again vigorously attacked by the sea. The geological structure is irregular and not clearly related to the distribution of the individual islands. The old-mountain uplands are best preserved where the rocks are somewhat uniformly resistant, as on Andros; elsewhere, variety of structure leads to variety of form, Naxos being of most rugged relief. The valleys are rather sharply incised beneath the uplands; the author parenthetically notes that they would be called 'young' by American morphologists. They represent the headwater parts of what was once a much more extensive drainage system, developed while the land stood higher than at present. During that time the sea is believed to have actively abraded the coast, producing a platform of tolerably even surface from three to fifteen miles wide, with greater breadth on the exposed than on the protected sides of the islands. The depth of the platform decreases from about 200 met. at its outer border to about 80 or 50 met. near the islands; and hence a slow depression is inferred during abrasion. Then came the more rapid submergence, bringing the sea about to its present level on the steep coast that had previously been cut around the remnant islands, and transforming the valleys into bays whose depth corresponds to that of the inner border of the submerged platform. The exposed parts of the present shore line are usually bold and ragged. Few of the islands have lowland plains, those on the western side of Naxos being the largest.

In not making explicit mention of the work of subaerial erosion during the inferred abrasion of the now submerged platform, Philippson's summary may give the impression that the greater part of the old-mountain uplands were consumed by the sea. It is probable, however, that many deep and broad valleys were eroded in the original uplands by streams, while the outer border of the platform was cut away by the waves; and that the further abrasion by the sea was aided not only

by slow depression but also by the work already then accomplished by subaerial erosion. Only by supposing an extensive system of open valleys to have been developed during the earlier advance of wave work on the retreating coast can satisfactory explanation be given for the scattered arrangement of the remnant islands on the abraded platform.

THE SOUTHERN URALS.

THE excursion of the Russian geological congress turned attention to the Urals as an example of an uplifted and dissected peneplain. Further information on this subject is found in some 'Topographic notes on the Ural Mountains,' by Purington (*Bull. Amer. Geogr. Soc.*, XXXIII., 1901, 103–111). The southern extension of this old chain, where the structure is as greatly disordered as elsewhere, is for the most part a gently undulating plain, the Orenburg steppe, hundreds of miles in extent. Its surface is compared to that of a calm sea, swept by huge, flat, crossing swells, 100 or 200 feet high and from two to four miles from crest to crest. The general turf cover of the nearly treeless plain is frequently broken by low reefs of quartzitic schists, traceable for long distances, and thus revealing something of the underground structure. Some of the more decomposable schists are weathered so deeply that mine shafts have been dug 100 feet deep before blasting was necessary. Water-worn gold-bearing gravels are abundant on the undulating plain, but are frequently too far from the streams for profitable washing. Low monadnocks of the more resistant rocks occur in the region of the steppe; further north in the forested Urals the higher extension of the same peneplain is dominated by dome-shaped monadnocks, rising 3,000 and 4,000 feet over the uplands. The rivers of the steppe have now eroded broad and shallow valleys from 50 to 200 feet deep; the sides of the valleys are well defined where they rise to the upland, whose borders are dissected by ravines for a few hundred feet. The valley floors are sheeted with gravels in which the rivers meander freely.

W. M. DAVIS.

THE STRECKER COLLECTION OF LEPIDOPTERA AND THE AMERICAN MUSEUM OF NATURAL HISTORY.

SINCE the death of Dr. Herman Strecker, many representatives of large museums have visited his former home in Reading, Pennsylvania, and commendable zeal has been displayed in their efforts to secure the Strecker collection of lepidoptera for their respective institutions. The heirs, however, have insisted that no deviation would be made from the original valuation placed upon the collection by Dr. Strecker, namely $20,000. The Right Reverend Dean Hoffman has authorized the American Museum to purchase the collection. This is not the first time that Dean Hoffman has benefited the people of New York by gifts of like character, and the silent appreciation of the thousands that visit the superb exhibition of butterflies and moths which his generosity has made possible is itself a testimonial of public gratitude.

The growth of the Department of Entomology within the last few years has been phenomenal. In 1890 Mrs. M. S. Elliot donated the 'Elliot Collection,' consisting of six thousand local specimens, all reared from caterpillars, and consequently as nearly absolutely perfect as specimens can be—butterflies that are captured in the field are almost invariably injured. In 1892 friends of the Museum contributed some $15,000 toward the purchase of the 'Harry Edwards Collection.' This was a general collection of insects, but contained some forty to fifty thousand butterflies and moths from various parts of the world; among these were some three hundred which were absolutely new to science. For a long time this has remained the principal part of the Museum collection. In 1891 a collection of insects numbering some ten thousand, and containing at least three thousand North American Lepidoptera, was donated by Mr. James Angus. Mr. Angus had made a specialty of one genus of moths, the *Catocala*, and in this one genus alone he had upwards of fifteen hundred specimens. In 1897 Mr. William Schaus, then of New York, but now of England, donated a remarkably complete collection of Old World Lepidoptera, numbering

some five thousand specimens, all authoritatively named, and many representing most remote localities.

The arrival of the Strecker material will increase the Museum collections by fully one hundred thousand specimens, among which are several hundred 'types.' Mr. William Beutenmüller, the curator of entomology, will personally attend to the details of transportation. The Museum will also receive the 'Strecker Library.'

THE MISSOURI BOTANICAL GARDEN.

FROM advance sheets of the administrative report of the Garden for 1901, it appears that during the past year $44,409 was spent on the maintenance and improvement of the establishment, $5,287.60 less than the net income for the year after providing for publications and certain fixed events designated in Henry Shaw's will, the total gross receipts being $125,690.73.

91,262 persons visited the Garden, about 45 per cent. of this number on the first Sunday afternoon each in June and September, the only two holidays on which the Garden can be opened to the public.

The collection of living plants, which in 1900 contained 9,194 species or varieties, has been increased to 9,967. Nearly 3,000 surplus plants were distributed to hospitals and schools. Exchange relations were maintained with other botanical establishments, and in addition to what was derived from these sources the living collections were increased by an expenditure of $2,829.61.

16,256 sheets of specimens were incorporated in the herbarium ,on which $1,175.39 was spent, and the herbarium is stated to consist now of about 365,000 specimens, valued at $54,743.00.

$2,688.71 was spent on the library, to which 929 books and 254 pamphlets were added, and the library now contains about 36,000 books and pamphlets, valued at $60,305.00, in addition to which there are about 275,500 index cards.

The extent of the exchange relations of the Garden is shown by the Director's statement that 1,184 serial publications are received at the library, of which 1,083 are received in exchange for the Reports of the Garden.

THE NATIONAL GEOGRAPHIC SOCIETY.

SEVERAL announcements of plans and progress are made by the National Geographic Society. A handsome building, costing $50,000, is being erected for the Society and as a memorial to its first President, Hon. Gardiner Greene Hubbard. The building is located on the corner of M and 16th Streets, in the central part of the city.

The annual meeting of the Society was held on the 10th of January, Alexander Graham Bell in the chair. The membership of the Society is now about 2,700, representing every State in the Union. The following directors were elected for three years:

Alexander Graham Bell, General A. W. Greely, chief signal officer of the War Department; Henry Gannett, chief geographer of the U. S. Geological Survey; Angelo Heilprin, Academy of Natural Sciences, Philadelphia; Gifford Pinchot, forester of the U. S. Government; O. H. Tittmann, director of the Coast and Geodetic Survey; W J McGee, ethnologist in charge of the Bureau of American Ethnology, and Russell Hinman, New York City.

The National Geographic Society is already forming plans for the great International Congress of Geographers which will be held under its auspices in Washington in 1904. It is the first time the Congress has met in the Western Hemisphere. These geographic Congresses are of international importance and it is expected that representatives from all parts of the world will attend.

SCIENTIFIC NOTES AND NEWS.

AT the meeting of the Paris Academy of Sciences on January 6, M. Bouquet de la Grye, the engineer, succeeded to the presidency. M. Albert Gaudry, the paleontologist, was elected vice-president, and will be elected president next year.

THE Lavoisier medal of the Paris Academy of Sciences has been awarded to Dr. Emil Fischer, professor of chemistry in the University of Berlin.

Dr. John C. Smock, for many years state geologist of New Jersey, has been given the degree of LL.D. by Rutgers College.

Mr. William Marconi was entertained by the American Institute of Electrical Engineers on January 15.

Dr. T. C. Chamberlin, professor of geology at the University of Chicago, has been re-elected president of the Chicago Academy of Sciences.

Lord Kelvin expects to visit the United States at the end of next month.

Dr. B. O. Peirce, Hollis professor of mathematics and natural philosophy at Harvard University, has returned from Europe. He expects to resume the duties of his professorship at the beginning of next year.

Professor C. H. Eigenmann has leave of absence during March, and will visit some of the caves of western Cuba to secure a series of the cave fauna and especially specimens of the cave fishes *Stygicola* and *Lucifuga*.

Professor Mortimer E. Cooley, head of the department of mechanical engineering in the University of Michigan, was nominated for the presidency of the Michigan Engineering Society, at the session of January 8, held at Grand Rapids.

Professor William Hallock, of Columbia University, has been elected president of the New York State Teachers' Science Association.

Professor Kossel, who holds the chair of physiology at Heidelberg, has been elected a member of the Stockholm Academy of Sciences.

Professor Sadebeck, director of the Botanical Museum at Hamburg, has retired.

The Colonial Museum at Harlem has arranged to commemorate, on June 15, the two-hundredth anniversary of the death of the naturalist, Rumphius, who for forty years carried on work in botany and other branches of natural history on the Island Amboina, one of the Molucca Islands. A medal will be struck which can be obtained, silver or bronze, and a memorial book will be issued.

A committee has been formed at Cromarty, the birthplace of Hugh Miller, the purposes of which are to erect a museum and library to celebrate the centenary of Hugh Miller's birth.

Dr. Alpheus Hyatt, curator of the Boston Society of Natural History, assistant in invertebrate paleontology in the Harvard Museum of Comparative Zoology and professor of biology and zoology in Boston University, one of the most eminent of American naturalists, died suddenly from apoplexy at Cambridge on January 15, aged sixty-three years.

Mr. J. F. Ward, a well-known engineer, died on January 16, aged seventy-one years.

T. T. T. Thorell, a distinguished arachnologist, died at Helsingborg, Sweden, on December 23, in his seventy-second year.

Dr. C. P. Tiele, professor of comparative religions at the University at Leyden, died on January 13 at the age of seventy-one years.

Dr. Hugo von Perger, professor of applied chemistry in the Technological Institute in Vienna, has died at the age of fifty-nine years.

Mr. James P. Shipman, who published a number of papers on the geology and paleontology of the region about Nottingham, recently died at the age of fifty-three years.

The position of chief mechanician in the National Bureau of Standards at a salary of $1,400 will be filled by civil service examination on February 26.

We learn from *Nature* that Dr. W. A. Herdman, F.R.S., professor of zoology at University College, Liverpool, sailed for Ceylon on December 26, 1901, to undertake for the government an investigation of the pearl oyster fisheries of the Gulf of Manaar. He is accompanied by an assistant, and in Ceylon the inspector of the fisheries and his staff will co-operate and provide boats and divers. A suitable steamer for dredging and trawling will be placed at Professor Herdman's disposal by the Government of Ceylon; and the necessary gear and apparatus for collecting and observational work, and for biological experiments, have been sent out in advance. Professor Herdman has arranged to take samples

of the plankton throughout the voyage to Ceylon, and to launch current-floats at particular parts of the course.

REUTER'S representative has had an interview with Captain J. E. Bernier, the Canadian explorer, who is organizing an arctic expedition. Since his last visit to England, when he lectured before the Colonial Institute, he has been in Canada, where he has secured the active support and cooperation of the Dominion Government for his scheme. Captain Bernier, who is devoting his services gratuitously, estimates the cost of his expedition at £30,000. Of this he has already secured £20,000, including a contribution of £1,250 from the Dominion Government, and £1,000 from Lord Strathcona, besides large donations from Canadian ministers, members of Parliament, merchants and others. Captain Bernier is now in London with the object of procuring from English subscribers the balance of £10,000 necessary for his scheme.

THROUGH the kindness of Mr. B. Talbot B. Hyde, there was an exhibition of the weaving of Navajo blankets and of beaten silver ornaments by Navajo Indians from New Mexico in the Educational Museum of Teachers College, Columbia University, on January 13.

THE Montreal correspondent of the New York *Evening Post* reports that the Hon. E. H. Monson, of Ottawa, has given a sum of money to the medical faculty for researches into possible cures for tuberculosis. They are to be carried on by Dr. A. G. Nicholls, lecturer in pathology, under the direction of Dr. J. G. Adami, professor of pathology.

A BACTERIOLOGICAL institute has been established at Davos, Switzerland.

THE trustees of the estate of the late Nathan Haskell Dole have given $100,000 for the Boston Public Library.

THE membership of the New York Zoological Society, according to the report of the executive committee, submitted at the sixth annual meeting on Jan. 14, is now 1,063, and is steadily increasing. The total attendance at the park in the past year was 527,145, the greatest attendance on one day being 20,206, on Sunday, August 24. The important work done included the erection of the Primates' House, at a cost of $64,160; the beginning of the Lion House, to cost, when complete, about $150,000; the extension of the sewer and water systems of the park, at a cost of $10,406, and the development of Mountain Sheep Hill and enclosures, at a cost of $2,500. Director Hornaday reported that the Zoological Park now contains 1,674 live exhibits, of which 416 are mammals, 659 birds and 599 reptiles.

A PETITION has been presented to King Edward for the incorporation of the British Academy for the Promotion of Historical, Philosophical and Philological Studies, and has been referred to a committee of Lords in Council.

REPRESENTATIVE SOUTHARD, of Ohio, chairman of the House Committee on Coinage, has sent invitations to a number of the chief manufacturers, merchants and others engaged in mercantile pursuits, to appear before the Coinage Committee on February 6 at a hearing on the bill for the adoption of the metric system of weights and measures.

THE Treasury agents state that during the past season an epidemic has prevailed among the murres, of the Pribilof Islands, and that the birds, which are found there in vast numbers, have perished by thousands. The first intimation of disease was the presence of birds about the village of St. Paul, close in shore, so weak that they were readily taken by the children. Later dead birds washed ashore in such numbers that 212 were counted in 150 yards, while steamers from St. Michaels reported passing through large quantities of dead birds. This recalls the epidemic which has twice prevailed among the cormorants of the Commander Islands, greatly reducing their numbers.

THE following lectures before the Franklin Institute, of Philadelphia, are announced:

January 17—'The Austrian and Italian Tyrol': DR. CHARLES L. MITCHELL, Philadelphia.

January 24—'The Aborigines of the Arid Region': PROFESSOR W J MCGEE, Bureau of American Ethnology, Washington, D. C.

January 31—'Porto Rico': MAJOR GEO. G. GROFF, late Superintendent of Public Instruction in Porto Rico, Lewisburgh, Pa.

February 7—'The Gases of the Atmosphere': Dr. H. F. Keller, Central High School, Philadelphia.

February 14—'The Canyons and Sierras of the Great Southwest': Mr. Robert T. Hill, U. S. Geological Survey, Washington, D. C.

We have already noted the bequest to the Natural History Museum, London, by Mr. Philip Crowley, of the valuable collection of birds' eggs. In accordance with the terms of the will the trustees were permitted to take four clutches of eggs of each species, or more, should any species be useful or interesting by reason of variety or locality. The selection, the London *Times* states, has recently been completed, with the result that 15,200 eggs of birds have been added to the series of eggs preserved in the zoological department of the museum. The Crowley bequest falls only a few specimens short of the series of Indian birds' eggs presented to the nation by Mr. Allan Hume in 1885. Mr. Crowley began to form his collection more than forty years ago, one of his great acquisitions being Canon Tristram's fine collection, which contained an egg of the great auk and one of the Labrador duck. These two rare eggs now pass into the possession of the national museum—a matter of some satisfaction, as hitherto the great auk has been represented in Cromwell Road by two very poor and broken specimens. The Crowley great auk's egg was bought in 1853 for £35. A very fine specimen which came into the market last year realized 315 guineas. One of the most interesting features of the Crowley collection is the remarkable series of cuckoo's eggs with those of the foster-parents. Of these there are as many as 87 different clutches, while 37 species are represented. As regards Australian birds the museum series has hitherto been markedly deficient, and as the Crowley collection was particularly rich in the eggs of that continent the increase in this respect is very appreciable. From a rough estimate it appears that the series of eggs in the Natural History Museum has been increased by nearly a third in respect of numbers, and as regards the species represented, by at least 15 per cent. Mr. Crowley also left the museum the pick of his valuable collection of exotic butterflies. The number of specimens retained for the museum was nearly 27,000, representing about 9,900 species. The selection made will enable the museum authorities to fill important gaps in the collection, which was most deficient in examples from the localities in which the Crowley collection was especially rich—namely, West Africa, the Moluccas, and Central and Southern America.

UNIVERSITY AND EDUCATIONAL NEWS.

Among the gifts recently received by the University of Pennsylvania are: Mr. William Ivins, $2,500 for the new Medical Laboratories; Mr. James Hay, $2,500 for the Engineering Departments; Mr. Ralph C. Stewart, '99 C. and '02 L., $5,000 towards the new building of the Department of Law.

General Isaac J. Wistar has paid $12,000 for a triangular lot of ground at Thirty-seventh Street and Woodland Avenue, on which a city police station now stands. The land will be presented to the University of Pennsylvania, so that the Wistar Institute of Anatomy and Biology, which adjoins on the east, and which is also a gift of General Wistar to the University, may be enlarged.

Mr. John D. Rockefeller has promised to double all sums of money given to Vassar College up to $200,000, between this time and June, 1902.

Dr. Henry Hopkins, a congregational clergyman, has been elected president of Williams College. He is the son of Mark Hopkins, who was president of the college from 1836 to 1872.

Dr. Samuel Weir, formerly of New York University, has accepted a lectureship in pedagogy at the University of Cincinnati, for the remainder of this year.

Dr. Hansdorff, docent in astronomy and mathematics in the University at Leipzig, has been appointed to an assistant professorship. Dr. K. Zeissig has been appointed assistant professor of physics at the Technical Institute at Darmstadt, and Dr. Parmentier assistant professor of botany at the University of Besançon.